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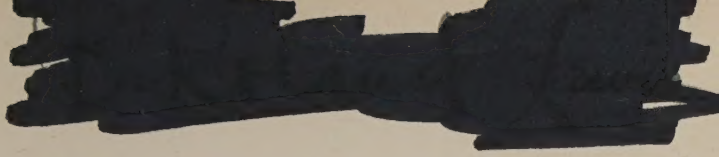

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ENGLISH AND ENGINEERING

BY THE EDITOR OF THIS VOLUME

ELIZABETHAN ROGUES AND VAGABONDS, and their Representation in Contemporary Literature.

COLLEGE ENGLISH: a Manual for the Study of English Literature and Composition.

MATERIALS FOR THE STUDY OF ENGLISH LITERATURE AND COMPOSITION: Selections from Newman, Arnold, Huxley, Ruskin and Carlyle.

ENGLISH AND ENGINEERING

A VOLUME OF ESSAYS FOR ENGLISH CLASSES IN ENGINEERING SCHOOLS

EDITED BY
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PREFACE

Although I must take the responsibility for the idea and plan of this collection, my obligations to different men for help and suggestions are numerous. Among practical engineers, teachers of engineering subjects, and teachers of English in engineering schools alike I have found the most intense interest in the subject of English for technical students, for the double end of helping them to express themselves better in writing and speaking and of broadening their outlook on life — two aims which, in my opinion, can best be realized together. I have not hesitated to adopt ideas wherever I could find them and it is impossible for me in many cases to give credit where it is due. I must, however, take this opportunity to acknowledge my obligations to Professors Comfort A. Adams, Dugald C. Jackson and A. E. Norton of the Massachusetts Institute of Technology, Mr. Farley Osgood and Mr. William Vanderpoel of the Public Service Corporation of New Jersey, and, in still greater degree, to Dr. C. R. Mann of the Carnegie Foundation and to Professor H. G. Pearson of the English Department of the Massachusetts Institute of Technology, whose advice and help on a hundred points have been of the greatest value. To Mr. W. A. Crosby and Mr. Percy Marks of the English Department of the Massachusetts Institute of Technology my thanks are due for assistance with

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F. A.

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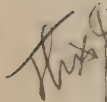
INTRODUCTION

The problem of teaching the engineering student to express himself well in writing and speaking is more than the problem of instructing him, by means of books or lectures or corrections on themes, in words and the uses of words. There is no profitable treatment of words that is not also a treatment of ideas. Training in expression must be also training in thought or the result will be insincere, wordy, artificial, self-conscious — in a word — bad expression. It is impossible to give a student any real power over language until he comes to regard language as a means for the expression of thought, and to realize that the thought is the important thing. No student (nor any other person) ought to write unless he has something to say and a strong desire to say it. Given these two things, it is easy to make him see when he has said it well and when badly, and to help him improve his power of expression.

For reasons which are given at length below, the ideas with which the engineering student and his English teacher can most profitably deal are those embodied not in his technical engineering subjects but in literature, *once the connection* (and this is important) *between engineering and literature is made clear.* That such a connection exists is apparently evident to the practical engineers who are in these days expressing themselves emphatically upon this point in the many

addresses printed by them every year on engineering education. It will not be evident to the student until he has thought it out, but, once he has, he will bring to the study of English the same keenness and enthusiasm which he has for his technical subjects, and will master it with the same facility.

This book is accordingly built upon the theory that the function of English in technical education is twofold: in the first place to train students to express themselves in writing and speaking, not merely grammatically but with order, force, sincerity, and such charm as their natures will allow; in the second, to furnish something of the liberal, humanizing, and broadening element which is more and more felt to be a necessary part of an engineering education. The two aims are in reality closely connected. A man will write crudely if his thinking is crude: there is no way in which an engineer can produce, in writing or speaking, the effect of an educated man unless he is educated; and, if one may take the word of the leaders in the profession, that part of his training which tends to humanize him, to develop him as a man, makes him to just that degree a better engineer.



The engineer must deal with men as well as with machines. He must be able to think and to express himself in terms that other men will understand. He must be able to marshal and to arrange his thoughts about intricate and difficult matters so as to make them plain and clear and forcible. Eloquence in the old bombastic sense of the term is not demanded of him, but it is demanded that he have clearness and force and the ability to present a long and complicated series of arguments, to weigh evidence on this side and that, and

to come to a conclusion which will carry conviction.

The engineer is destined to become an important figure, a leader, in the new age which is just now dawning. He cannot occupy a position of such importance without his heavy share of duties and responsibilities. He cannot be a leader without taking upon himself the task of solving many of the gravest problems of our civilization, human problems as well as mechanical, problems in finance, in government, in education, and in social life. The engineer must direct the labors of thousands of uneducated men, and he cannot escape some responsibility for their well-being. The work of his hands and brain may build up or destroy the welfare of whole industrial communities and of gigantic corporations. As an employer of younger engineers he must take an active part in their education, that great part of education which comes when school days are over, and he may, if he have the wisdom, exercise a human influence more important than he can ever estimate. With such a rôle to play in the development of our civilization the engineer must think in terms of civilization, in human terms as well as material, or be a traitor to his opportunities.

The thought of the race, the material of our civilization as it exists today, falls into two great divisions, literature (or, more broadly speaking, art) and science. Philosophy, which may be taken to constitute a third, is really a commentary upon both: either literature or science pursued far enough becomes philosophy. That education which is exclusively literary or exclusively scientific is one-sided and narrow. The one thing which gives breadth is the understanding of the relations between the two, the ability to see life from

both angles. To lay a foundation for the understanding of the relation of literature and science is one of the first requisites of that training which aims to educate engineers that they may be "not only expert in science but reverent toward life."

Here is the function of literature, and in this idea lies the unity of the two aims of English work. To train the student to write by first training him to think: to stimulate his thought by directing his attenion to problems of his own profession and of his own education and to the illumination of them which he can find in literature: these two tasks may be performed together — better together than separately — and with that double aim in view this collection has been made.

The outline and arrangement of the book are dictated by the aims which have just been explained. The first section is an attempt to make the student see the dependence of writing on thinking, to impress upon him the first of all principles of good writing, that he must have something to say. The sad results of trying to teach students to write on the other principle, putting the stress not upon thought but upon words, need no commentary to one who has studied the history of the teaching of English in this country. The trend of recent opinion is in the other direction and that fact is the best of auguries for the effective teaching of composition.

The sections following are intended to direct the student in thinking out for himself the relations of his scientific studies to that other great body of thought contained in literature. The bridge is not ready built: the task of building it is left to him under the guidance

of his teacher. A variety of considerations and points of view are presented with the design of stimulating his thought, not of doing his thinking for him.

The second and third sections are devoted to essays dealing with the profession of engineering and the demands which it makes on the engineering schools. The student can never see the relation between engineering and literature until he has some idea of what he means by engineering, until he makes up his mind for himself whether he is learning a trade or a profession, and until he forms for himself some conception of the opportunity of the engineer for human leadership in this new epoch which is being ushered in by the manufacture of power. Once he has thought about that subject he is ready to think more clearly and more broadly about the aims of engineering education. It is impossible to educate a man without his consent. It is impossible to educate him broadly if what he wants is only the narrow rules-of-thumb which might fit him to follow a trade but which are inadequate to the demands of a liberal and intellectual profession. Hence the importance of having a student read thoughtfully at the very outset of his career what the leaders of the profession have said about the true aims of engineering education.

These topics lead directly to the question of the relation between pure science and applied, and that problem leads straight to the central one of the relation of science to literature and of the part which each plays in education — not merely in the education which fits a man for the practice of his profession but also in that solution of the great mysteries of life which each man must seek for himself. The student who has followed

the train of thought so far should have a new point of view toward literature, a point of view which will enable him to see in it not something alien to all his work and interests, nor merely an elegant amusement for his idle hours, but rather a body of thought bearing in a thousand ways upon his scientific studies and his relations with other men.

The final section, "Literature and Life," offers definite illustrations of literature as a comment on life. The essays which could be included are only a few from a very large field and their purpose is merely suggestive, to teach the student to read thoughtfully and to apply what he reads to his own personal life. This section of the book may be taken as a kind of introduction to further and more extended study of literature or to the student's own reading.

This volume is planned for reading in connection with constant discussion and writing. The different essays should be considered as supplying questions and topics for thought. Following the preliminary discussion in class of what any single essay is trying to say, comes the question, What do you think about it? At first the undergraduate will probably have few ideas. But the skillful teacher will find that if he follows question with question, on this side and that, points of view will soon begin to develop in the class-room. If he preserves an atmosphere in which thought is free and if he encourages each tentative opinion, differences will appear and trains of thought will be started which will demand careful statement in writing to do them justice. Here it is that the instructor will find material for oral and written composition, in which the student's reading will furnish stimulus and suggestion but not the

rule or limit for his thought. Themes should never be mere analyses or summaries but rather the expression of individual points of view or the expansion and illustration of single points in the essay under discussion, with direct reference to the life of the student and the problems of his own education.

Once interest is aroused in this way, correctness in writing is comparatively easy to achieve. For one thing the student who is interested in what he has to say, who feels that he is exploring new ground, will write more carefully than he does when he is merely trying to produce a "theme." And when he is eager to say as well as possible what he thinks, he will remember any suggestions that are made as to form. For the teaching of matters of form there is no economy equal to having a student interested in the ideas he is trying to express. The whole matter between form and content is one of emphasis. The wise teacher will never lose an opportunity to help his students in the attainment of correctness in language, and at the same time he will never fail to make clear to them that the sole justification of care in language is the adequate expression of thought so that it will be easily and pleasantly understandable to the audience they wish to reach.

The objection may be made to this entire program that thinking is one of those things which cannot be taught. The teacher of English composition, such an objector would say, must take his students as they are, teach them to express in language such thoughts as they have, and be content with that. He cannot hope to teach them to think beyond their natural capacities

and above the innate ideas and prejudices of their class and position, which they have when they come to him. It must be admitted that there is a color of truth in this objection. There is no magic formula, no program of the development of separate "faculties" which can be combined to produce the power of thought. But while thinking cannot in this sense be taught, it can be stimulated; the student's tentative attempts can be questioned and criticized in such a manner as to develop his mental power or to enable him to develop it for himself. The first of all requisites for this is that the teacher should himself be thinking with the class. Their minds will catch the flame from his. Then the questions which he is discussing with them must be such as to call forth the best efforts of his mind and theirs. Pre-digested mental food will not strengthen the mental power of assimilation any more than pre-digested physical food will the bodily. And, finally, the teacher must drop the rôle of master and assume that of the seeker after truth. His method must be that of Socrates, that of the "intellectual midwife," presiding over the birth of ideas. The triumph of his art will be "in thoroughly examining whether the thought which the mind of the young man brings forth is a false idol or a noble and true birth." Like Socrates he must arouse in his patients the pains and perplexity and travail of thought. Like Socrates he must be resolute in exposing the false opinion when it has been brought forth. Like Socrates, however, he must do this by appealing not to authority, either his own or another's or a book's, but by the appeal to reason, by the gentle art of refutation. By such methods will the teacher be able to awaken his pupils and to

stimulate them to think; by such methods will he succeed in purging their thought of the prejudices and intolerances and easy inherited assents which are the enemies of the truth. By these methods and by these alone can he teach them to write.

Such is the purpose of this book — to furnish the text and starting point for work of the kind just indicated. The aim of the editor will have been fulfilled if it leads the student to see for himself that there is imagination in science as well as in literature, reason in literature as well as in science, and human truth in both; if it sharpens his intellectual curiosity and teaches him to be content with no partial view, but to seek from science, from literature and from the practical world to build up for himself a conception of life worthy of his best thought, one which will impel him to take advantage of the broader and nobler and more human opportunities of his profession.

ENGLISH AND ENGINEERING

I

Writing and Thinking

By John Ruskin [1]

THE chief vices of education have arisen from the one great fallacy of supposing that noble language is a communicable trick of grammar and accent, instead of simply the careful expression of right thought. All the virtues of language are, in their roots, moral; it becomes accurate if the speaker desires to be true; clear, if he speaks with sympathy and a desire to be

1 These paragraphs on Writing and Thinking, which are to be taken as a kind of motto for this book, are from Ruskin's lecture on "The Relation of Art to Morals," which forms Chapter III of his *Lectures on Art*, 1870.

John Ruskin, 1819–1900, was an art critic and writer on social and economic questions: among his best known works are *Modern Painters*, 1843–60, *Unto This Last*, 1860, *Sesame and Lilies*, 1865, and *Crown of Wild Olive*, 1866. Ruskin has perhaps been most influential in his attempt to show the connection between the art of a people and the social, economic, and religious conditions of their lives. This selection on the art of writing is typical of his point of view toward all the arts.

Following to some extent the lead of Carlyle, Ruskin attacked the problems of nineteenth-century industrialism in a way which has had an important influence on the political economy of today. An illustration is the essay, "Traffic," printed in this volume; this aspect of his work is ably discussed by J. A. Hobson in his book, *John Ruskin, Social Reformer*. "The Mystery of Life and Its Arts," which forms the last selection in this collection, is an attempt to show the inevitable connection of art and literature with the fundamental problems of life.—EDITOR.

intelligible; powerful, if he has earnestness; pleasant, if he has sense of rhythm and order. There are no other virtues of language producible by art than these: but let me mark more deeply for an instant the significance of one of them. Language, I said, is only clear when it is sympathetic. You can, in truth, understand a man's word only by understanding his temper. Your own word is also as of an unknown tongue to him unless he understands yours. And it is this which makes the art of language, if any one is to be chosen separately from the rest, that which is fittest for the instrument of a gentleman's education. To teach the meaning of a word thoroughly, is to teach the nature of the spirit that coined it; the secret of language is the secret of sympathy, and its full charm is possible only to the gentle. And thus the principles of beautiful speech have all been fixed by sincere and kindly speech. On the laws which have been determined by sincerity, false speech, apparently beautiful, may afterwards be constructed; but all such utterance, whether in oration or poetry, is not only without permanent power, but it is destructive of the principles it has usurped. So long as no words are uttered but in faithfulness, so long the art of language goes on exalting itself; but the moment it is shaped and chiselled on external principles, it falls into frivolity, and perishes. And this truth would have been long ago manifest, had it not been that in periods of advanced academical science there is always a tendency to deny the sincerity of the first masters of language. Once learn to write gracefully in the manner of an ancient author, and we are apt to think that he also wrote in the manner of some

one else. But no noble nor right style was ever yet founded but out of a sincere heart.

No man is worth reading to form your style, who does not mean what he says; nor was any great style ever invented but by some man who meant what he said. Find out the beginner of a great manner of writing, and you have also found the declarer of some true facts or sincere passions: and your whole method of reading will thus be quickened, for, being sure that your author really meant what he said, you will be much more careful to ascertain what it is that he means.

And of yet greater importance is it deeply to know that every beauty possessed by the language of a nation is significant of the innermost laws of its being. Keep the temper of the people stern and manly; make their associations grave, courteous, and for worthy objects; occupy them in just deeds; and their tongue must needs be a grand one. Nor is it possible, therefore — observe the necessary reflected action — that any tongue should be a noble one, of which the words are not so many trumpet-calls to action. All great languages invariably utter great things, and command them; they cannot be mimicked but by obedience; the breath of them is inspiration because it is not only vocal, but vital; and you can only learn to speak as these men spoke, by becoming what these men were.

II

The Question of Style

By Arnold Bennett [1]

In discussing the value of particular books, I have heard people say — people who were timid about expressing their views of literature in the presence of literary men: "It may be bad from a literary point of view, but there are very good things in it." Or: "I dare say the style is very bad, but really the book is very interesting and suggestive." Or: "I'm not an expert, and so I never bother my head about good style. All I ask for is good matter. And when I have got it, critics may say what they like about the book." And many other similar remarks, all showing that in the minds of the speakers there existed a notion that style is something supplementary to, and distinguishable from, matter; a sort of notion that a writer who wanted to be classical had first to find and arrange his matter, and then dress it up ele-

1 This essay is the sixth chapter of Mr. Arnold Bennett's excellent little book, *Literary Taste and How to Form It,* first published in 1909. It is reprinted here by kind permission of the George H. Doran Company, publishers.

Enoch Arnold Bennett was born in 1867 and is today one of the leading English writers of novels, plays, and popular treatises, designated by him "Popular Philosophies." Among his best known works are the trilogy, *Clayhanger, Hilda Lessways,* and *These Twain,* the *Old Wives' Tale, Buried Alive, Milestones,* and *How to Live on 24 Hours a Day.*—Editor.

gantly in a costume of style, in order to please beings called literary critics.

This is a misapprehension. Style cannot be distinguished from matter. When a writer conceives an idea he conceives it in a form of words. That form of words constitutes his style, and it is absolutely governed by the idea. The idea can only exist in words, and it can only exist in one form of words. You cannot say exactly the same thing in two different ways. Slightly alter the expression, and you slightly alter the idea. Surely it is obvious that the expression cannot be altered without altering the thing expressed! A writer, having conceived and expressed an idea, may, and probably will, "polish it up." But what does he polish up? To say that he polishes up his style is merely to say that he is polishing up his idea, that he has discovered faults or imperfections in his idea, and is perfecting it. An idea exists in proportion as it is expressed; it exists when it is expressed, and not before. It expresses itself. A clear idea is expressed clearly, and a vague idea vaguely. You need but take your own case and your own speech. For just as science is the development of common-sense, so is literature the development of common daily speech. The difference between science and common-sense is simply one of degree; similarly with speech and literature. Well, when you "know what you think," you succeed in saying what you think, in making yourself understood. When you "don't know what to think," your expressive tongue halts. And note how in daily life the characteristics of your style follow your mood; how tender it is when you are tender, how violent when you are violent.

You have said to yourself in moments of emotion: "If only I could write —," etc. You were wrong. You ought to have said: "If only I could *think* — on this high plane." When you have thought clearly you have never had any difficulty in saying what you thought, though you may occasionally have had some difficulty in keeping it to yourself. And when you cannot express yourself, depend upon it that you have nothing precise to express, and that what incommodes you is not the vain desire to express, but the vain desire to *think* more clearly. All this just to illustrate how style and matter are co-existent, and inseparable, and alike.

You cannot have good matter with bad style. Examine the point more closely. A man wishes to convey a fine idea to you. He employs a form of words. That form of words is his style. Having read, you say: "Yes, this idea is fine." The writer has therefore achieved his end. But in what imaginable circumstances can you say: "Yes, this idea is fine, but the style is not fine"? The sole medium of communication between you and the author has been the form of words. The fine idea has reached you. How? In the words, by the words. Hence the fineness must be in the words. You may say, superiorly: "He has expressed himself clumsily, but I can *see* what he means." By what light? By something in the words, in the style. That something is fine. Moreover, if the style is clumsy, are you sure that you can see what he means? You cannot be quite sure. And, at any rate, you cannot see distinctly. The "matter" is

what actually reaches you, and it must necessarily be affected by the style.

Still further to comprehend what style is, let me ask you to think of a writer's style exactly as you would think of the gestures and manners of an acquaintance. You know the man whose demeanor is "always calm," but whose passions are strong. How do you know that his passions are strong? Because he "gives them away" by some small, but important, part of his demeanor, such as the twitching of a lip or the whitening of the knuckles caused by clenching the hand. In other words, his demeanor, fundamentally, is not calm. You know the man who is always "smoothly polite and agreeable," but who affects you unpleasantly. Why does he affect you unpleasantly? Because he is tedious, and therefore disagreeable, and because his politeness is not real politeness. You know the man who is awkward, shy, clumsy, but who, nevertheless, impresses you with a sense of dignity and force. Why? Because mingled with that awkwardness and so forth *is* dignity. You know the blunt, rough fellow whom you instinctively guess to be affectionate — because there is "something in his tone" or "something in his eyes." In every instance the demeanor, while perhaps seeming to be contrary to the character, is really in accord with it. The demeanor never contradicts the character. It is one part of the character that contradicts another part of the character. For, after all, the blunt man *is* blunt, and the awkward man *is* awkward, and these characteristics are defects. The demeanor merely

expresses them. The two men would be better if, while conserving their good qualities, they had the superficial attributes of smoothness and agreeableness possessed by the gentleman who is unpleasant to you. And as regards this latter, it is not his superficial attributes which are unpleasant to you, but his other qualities. In the end the character is shown in the demeanor; and the demeanor is a consequence of the character and resembles the character. So with style and matter. You may argue that the blunt, rough man's demeanor is unfair to his tenderness. I do not think so. For his churlishness is really very trying and painful, even to the man's wife, though a moment's tenderness will make her and you forget it. The man really is churlish, and much more often than he is tender. His demeanor is merely just to his character. So, when a writer annoys you for ten pages and then enchants you for ten lines, you must not explode against his style. You must not say that his style won't let his matter "come out." You must remember the churlish, tender man. The more you reflect, the more clearly you will see that faults and excellences of style are faults and excellences of matter itself.

One of the most striking illustrations of this neglected truth is Thomas Carlyle. How often has it been said that Carlyle's matter is marred by the harshness and the eccentricities of his style? But Carlyle's matter is harsh and eccentric to precisely the same degree as his style is harsh and eccentric. Carlyle was harsh and eccentric. His behavior was frequently ridiculous, if it were not abominable. His judgments

were often extremely bizarre. When you read one of Carlyle's fierce diatribes, you say to yourself: "This is splendid. The man's enthusiasm for justice and truth is glorious." But you also say: "He is a little unjust and a little untruthful. He goes too far. He lashes too hard." These things are not the style; they are the matter. And when, as in his greatest moments, he is emotional and restrained at once, you say: "This is the real Carlyle." Kindly notice how perfect the style has become! No harshnesses or eccentricities now! And if that particular matter is the "real" Carlyle, then that particular style is Carlyle's "real" style. But when you say "real" you would more properly say "best." "This is the best Carlyle." If Carlyle had always been at his best he would have counted among the supreme geniuses of the world. But he was a mixture. His style is the expression of the mixture. The faults are only in the style because they are in the matter.

You will find that, in classical literature, the style always follows the mood of the matter. Thus, Charles Lamb's essay on "Dream Children" begins quite simply, in a calm, narrative manner, enlivened by a certain quippishness concerning the children. The style is grave when great-grandmother Field is the subject, and when the author passes to a rather elaborate impression of the picturesque old mansion it becomes as it were consciously beautiful. This beauty is intensified in the description of the still more beautiful garden. But the real dividing point of the essay occurs when Lamb approaches his elder brother. He unmistakably marks the point with the phrase: "*Then, in somewhat*

a more heightened tone, I told how," etc. Henceforward the style increases in fervor and in solemnity until the culmination of the essay is reached: "And while I stood gazing, both the children gradually grew fainter to my view, receding and still receding till nothing at last but two mournful features were seen in the uttermost distance, which without speech, strangely impressed upon me the effects of speech. . . ." Throughout, the style is governed by the matter. "Well," you say, "of course it is. It couldn't be otherwise. If it were otherwise it would be ridiculous. A man who made love as though he were preaching a sermon, or a man who preached a sermon as though he were teasing schoolboys, or a man who described a death as though he were describing a practical joke, must necessarily be either an ass or a lunatic." Just so. You have put it in a nutshell. You have disposed of the problem of style so far as it can be disposed of.

But what do those people mean who say: "I read such and such an author for the beauty of his style alone"? Personally, I do not clearly know what they mean (and I have never been able to get them to explain), unless they mean that they read for the beauty of sound alone. When you read a book there are only three things of which you may be conscious: (1) The significance of the words, which is inseparably bound up with the thought. (2) The look of the printed words on the page — I do not suppose that anybody reads any author for the visual beauty of the words on the page. (3) The sound of the words, either actually uttered or imagined by the brain to be uttered. Now it is indubitable that words differ in

beauty of sound. To my mind one of the most beautiful words in the English language is "pavement." Enunciate it, study its sound, and see what you think. It is also indubitable that certain combinations of words have a more beautiful sound than certain other combinations. Thus Tennyson held that the most beautiful line he ever wrote was:

The mellow ousel fluting in the elm.

Perhaps, as sound, it was. Assuredly it makes a beautiful succession of sounds, and recalls the bird-sounds which it is intended to describe. But does it live in the memory as one of the rare great Tennysonian lines? It does not. It has charm, but the charm is merely curious or pretty. A whole poem composed of lines with no better recommendation than that line has would remain merely curious or pretty. It would not permanently interest. It would be as insipid as a pretty woman who had nothing behind her prettiness. It would not live. One may remark in this connection how the merely verbal felicities of Tennyson have lost our esteem. Who will now proclaim the *Idylls of the King* as a masterpiece? Of the thousands of lines written by him which please the ear, only those survive of which the matter is charged with emotion. No! As regards the man who professes to read an author "for his style alone," I am inclined to think either that he will soon get sick of that author, or that he is deceiving himself and means the author's general temperament — not the author's verbal style, but a peculiar quality which runs through all the matter written by the author. Just as one may like a man for something which is always coming out

of him, which one cannot define, and which is of the very essence of the man.

In judging the style of an author, you must employ the same canons as you use in judging men. If you do this you will not be tempted to attach importance to trifles that are negligible. There can be no lasting friendship without respect. If an author's style is such that you cannot *respect* it, then you may be sure that, despite any present pleasure which you may obtain from that author, there is something wrong with his matter, and that the pleasure will soon cloy. You must examine your sentiments towards an author. If when you have read an author you are pleased, without being conscious of aught but his mellifluousness, just conceive what your feelings would be after spending a month's holiday with a merely mellifluous man. If an author's style has pleased you, but done nothing except make you giggle, then reflect upon the ultimate tediousness of the man who can do nothing but jest. On the other hand, if you are impressed by what an author has said to you, but are aware of verbal clumsinesses in his work, you need worry about his "bad style" exactly as much and exactly as little as you would worry about the manners of a kind-hearted, keen-brained friend who was dangerous to carpets with a tea-cup in his hand. The friend's antics in a drawing-room are somewhat regrettable, but you would not say of him that his manners were bad. Again, if an author's style dazzles you instantly and blinds you to everything except its brilliant self, ask your soul, before you begin to admire his matter, what would be your final opinion of a man who at the first meeting fired his personality

into you like a broad-side. Reflect that, as a rule, the people whom you have come to esteem communicated themselves to you gradually, that they did not begin the entertainment with fireworks. In short, look at literature as you would look at life, and you cannot fail to perceive that, essentially, the style is the man. Decidedly you will never assert that you care nothing for style, that your enjoyment of an author's matter is unaffected by his style. And you will never assert, either, that style alone suffices for you.

If you are undecided upon a question of style, whether leaning to the favorable or to the unfavorable, the most prudent course is to forget that literary style exists. For, indeed, as style is understood by most people who have not analyzed their impressions under the influence of literature, there *is* no such thing as literary style. You cannot divide literature into two elements and say: This is matter and that style. Further, the significance and the worth of literature are to be comprehended and assessed in the same way as the significance and the worth of any other phenomenon: by the exercise of common-sense. Common-sense will tell you that nobody, not even a genius, can be simultaneously vulgar and distinguished, or beautiful and ugly, or precise and vague, or tender and harsh. And common-sense will therefore tell you that to try to set up vital contradictions between matter and style is absurd. When there is a superficial contradiction, one of the two mutually-contradicting qualities is of far less importance than the other. If you refer literature to the standards of life, common-sense will at once decide which quality should count

heaviest in your esteem. You will be in no danger of weighing a mere maladroitness of manner against a fine trait of character, or of letting a graceful deportment blind you to a fundamental vacuity. When in doubt, ignore style, and think of the matter as you would think of an individual.

III

On English Prose

By Frederic Harrison [1]

Fili mi Dilectissime (if, sir, I may borrow the words of the late Lord Derby when, as Chancellor of the University, he conferred the degree of D.C.L. on Lord Stanley, his son) — I fear that I am about to do an unwise thing. When, in an hour of paternal weakness, I accepted your invitation to address the Bodley Society on *Style,* it escaped me that it was a subject with which undergraduates have but small concern. And now I find myself talking on a matter whereof I know very little, and could do you no good even if I knew much, in presence of an illustrious historian, to say nothing of your own Head, who was an acknowledged master of English when my own literary style aspired to nothing more elegant than the dry forms of pleadings and deeds.

1 Mr. Harrison's address "On English Prose" was delivered in 1898 before the Bodley Literary Society, Oxford, of which his son, C. René Harrison, was President. It forms Chapter VII of his book, *Tennyson, Ruskin, Mill, and Other Literary Estimates,* and is reprinted here by kind permission of the Macmillan Company, publishers.

Frederic Harrison, who was born in 1831, is a well known English writer on historical, literary, and philosophical subjects. He was from 1880 to 1905 President of the English Positivist Committee, and has been, since his university days, a prominent exponent of the Positivist philosophy. This system, originated by Auguste Comte (1798–1857), bases its intellectual, social, and moral beliefs on the methods of natural science, and advocates a "Religion of Humanity" in the place of any worship of a supernatural being.— EDITOR.

Every one knows how futile for any actual result are those elaborate disquisitions on Style which some of the most consummate masters have amused themselves in compiling, but which serve at best to show how quite hackneyed truisms can be graced by an almost miraculous neatness of phrase. It is in vain to enjoin on us "propriety," "justness of expression," "suitability of our language to the subject we treat," and all the commonplaces which the schools of Addison and of Johnson in the last century promulgated as canons of good style. "Proper words in proper places," says Swift, "make the true definition of a style." "Each phrase in its right place," says Voltaire. Well! Swift and Voltaire knew how to do this with supreme skill; but it does not help us, if they cannot teach their art. *How* are we to know what is the *proper* word? *How* are we to find the *right* place? And even a greater than Swift or Voltaire is not much more practical as a teacher. "Suit the action to the word, and the word to the action," says Hamlet. "Be not too tame neither. Let your own discretion be your tutor." Can you trust your own discretion? Have undergraduates this discretion? And how could I, in presence of your College authority, suggest that you should have no tutor but your own discretion?

All this is as if a music-master were to say to a pupil, Sing always in tune and with the *right* intonation, and whatever you do, produce your voice in the *proper* way! Or, to make myself more intelligible to you here, it is as if W. G. Grace were to tell you, Play a "yorker" in the *right* way, and place the ball in the *proper* spot with reference to the field! We know that

neither the art of acting, nor of singing, nor of cricket can be taught by general commonplaces of this sort. And good prose is so far like cricket that the W. G.'s of literature, after ten or twenty "centuries," can tell you nothing more than this — to place your words in the right spot, and to choose the proper word, according to the "field" that you have before you.

The most famous essay on Style, I suppose, is that by one of the greatest wizards who ever used language — I mean the *Ars Poetica* of Horace, almost every line of which has become a household word in the educated world. But what avail his inimitable epigrams in practice? Who is helped by being told not to draw a man's head on a horse's neck, or a beautiful woman with the tail end of a fish? "Do not let brevity become obscurity; do not let your mountain in labor bring forth a mouse; turn over your Greek models night and day; your compositions must be not only correct, but must give delight, touch the heart," and so forth, and so forth. All these imperishable maxims, as clean cut as a sardonyx gem — these "chestnuts," as you call them in the slang of the day — serve as hard nuts for a translator to crack, and as handy mottoes at the head of an essay; but they are barren of any solid food as the shell of a walnut.

Then Voltaire, perhaps the greatest master of prose in any modern language, wrote an essay on Style, in the same vein of epigrammatic platitude. No declamation, says he, in a work on physics. No jesting in a treatise on mathematics. Well! but did Douglas Jerrold himself ever try to compose a Comic Trigonometry; and could another Charles Lamb find any fun in Spencer's First Principles? A fine style, says

Voltaire, makes anything delightful; but it is exceedingly difficult to acquire, and very rarely found. And all he has to say is, "Avoid grandiloquence, confusion, vulgarity, cheap wit, and colloquial slang in a tragedy." He might as well say, Take care to be as strong as Sandow, and as active as Prince Ranjitsinhji, and whatever you do, take care not to grow a nose like Cyrano de Bergerac in the new play!

An ingenious professor of literature has lately ventured to commit himself to an entire treatise on Style, wherein he has propounded everything that can usefully be said about this art, in a style which illustrates things that you should avoid. At the end of his book he declares that style cannot be taught. This is true enough; but if this had been the first, instead of the last, sentence of his piece, the book would not have been written at all. I remember that, when I stood for the Hertford Scholarship, we had to write a Latin epigram on the thesis —

Omnia liberius nullo poscente —
— *fatemur,* (I replied —)
Carmina cur poscas, carmine si sit opus?

And so I say now. Style cannot be taught. And this perhaps puts out of court the professor's essay, and no doubt my own also. Nothing practical can be said about Style. And no good can come to a young student by being anxious about Style. None of you by taking thought can add one cubit to his stature; no! nor one gem to his English prose, unless nature has endowed him with that rare gift — a subtle ear for the melody of words, a fastidious instinct for the connotations of a phrase.

You will, of course, understand that I am speaking of Style in that higher sense as it was used by Horace, Swift, Voltaire, and great writers, that is, Style as an element of permanent literature. It is no doubt very easy by practice and good advice to gain a moderate facility in writing current language, and even to get the trick of turning out lively articles and smart reviews. "'Tis as easy as lying; govern these ventages with your finger and thumb, give it breath with your mouth, and it will discourse most eloquent music"— quite up to the pitch of the journals and the magazines of our day, of which we are all proud. But this is a poor trade; and it would be a pity to waste your precious years of young study by learning to play on the literary "recorders." You may be taught to fret them. You will not learn to make them speak!

There are a few negative precepts, quite familiar common form, easy to remember, and not difficult to observe. These are all that any manual can lay down. The trouble comes in when we seek to apply them. What is it that is artifical, incongruous, obscure? How are we to be simple? Whence comes the music of language? What is the magic that can charm into life the apt and inevitable word that lies hidden somewhere at hand — so near and yet so far — so willing and yet so coy — did we only know the talisman which can awaken it? This is what no teaching can give us — what skillful tuition and assiduous practice can but improve in part, and even that only for the chosen few.

About Style, in the higher sense of the term, I think the young student should trouble himself as little as possible. When he does, it too often becomes the art of clothing thin ideas in well-made garments.

To gain skill in expression before he has got thoughts or knowledge to express, is somewhat premature; and to waste in the study of form those irrevocable years which should be absorbed in the study of things, is mere decadence and fraud. The young student — *ex hypothesi* — has to learn, not to teach. His duty is to digest knowledge, not to popularize it and carry it abroad. It is a grave mental defect to parade an external polish far more mature than the essential matter within. Where the learner is called on to express his thoughts in formal compositions — and the less he does this the better — it is enough that he put his ideas or his knowledge (if he has any) in clear and natural terms. But the less he labors the flow of his periods the more truly is he the honest learner, the less is his risk of being the smug purveyor of the crudities with which he has been crammed, the further is he from becoming one of those voluble charlatans whom the idle study of language so often breeds.

I look with sorrow on the habit which has grown up in the university since my day (in the far-off fifties) — the habit of making a considerable part of the education of the place to turn on the art of serving up gobbets of prepared information in essays more or less smooth and correct — more or less successful imitations of the viands that are cooked for us daily in the press. I have heard that a student has been asked to write as many as seven essays in a week, a task which would exhaust the fertility of a Swift. The bare art of writing readable paragraphs in passable English is easy enough to master; one that steady practice and good coaching can teach the average man. But it is a poor art, which readily lends itself to harm.

It leads the shallow ones to suppose themselves to be deep, the raw ones to fancy they are cultured, and it burdens the world with a deluge of facile commonplace. It is the business of a university to train the mind to think and to impart solid knowledge, not to turn out nimble penmen who may earn a living as the clerks and salesmen of literature.

Almost all that can be laid down as law about Style is contained in a sentence of Madame de Sévigné in her twentieth letter to her daughter. "Ne quittez jamais le naturel," she says; "votre tour s'y est formé, et cela compose un style parfait." I suppose I must translate this; for Madame de Sévigné is no subject for modern research, and our *Alma Mater* is concerned only with dead languages and remote epochs. "Never forsake what is natural," she writes; "you have moulded yourself in that vein, and this produces a perfect style." There is nothing more to be said. Be natural, be simple, be yourself: shun artifices, tricks, fashions. Gain the tone of ease, plainness, self-respect. To thine own self be true. Speak out frankly that which you have thought out in your own brain and have felt within your own soul. This, and this alone, creates a perfect style, as she says who wrote the most exquisite letters the world has known.

And so Molière, a consummate master of language and one of the soundest critics of any age, in that immortal scene of his *Misanthrope,* declares the euphuistic sonnets of the Court to be mere play of words, pure affectation, not worth a snatch from a peasant's song. That is not the way in which nature speaks, cries Alceste — *J'aime mieux ma mie* — that is how the heart gives utterance, without *colifichets,* with no

quips and cranks of speech, very dear to fancy, and of very liberal conceit. And Sainte-Beuve cites an admirable saying: "All peasants have style." They speak as nature prompts. They have never learned to play with words; they have picked up no tricks, mannerisms, and affectation like Osric and Oronte in the plays. They were not trained to write essays, and never got veterans to discourse to them on Style. Yet, as Sainte-Beuve says, they have style, because they have human nature, and they have never tried to get outside the natural, the simple, the homely. It is the secret of Wordsworth, as it was of Goldsmith, as it was of Homer.

. . . . . .

And now I know I must not end without hazarding a few practical hints — what betting men and undergraduates call "tips" — for general remarks upon literature have little interest for those whose mind runs on sports, and perhaps even less for those whose mind is absorbed in the schools. But as there are always some who dream of a life of "letters," an occupation already too crowded and far from inviting at the best, they will expect me to tell them how I think they may acquire a command of Style. I know no reason why they should, and I know no way they could set about it. But, supposing one has something to say — something that it concerns the world to know — and this, for a young student, is a considerable claim, "a large order," I think he calls it in the current dialect, all I have to tell him is this: Think it out quite clearly in your own mind, and then put it down in the simplest words that offer, just as if you were telling it to a

friend, but dropping the tags of the day with which your spoken discourse would naturally be garnished. Be familiar, but by no means vulgar. At any rate, be easy, colloquial if you like, but shun those vocables which come to us across the Atlantic, or from Newmarket and Whitechapel, with which the gilded youth and journalists "up-to-date" love to salt their language. Do not make us "sit up" too much, or always "take a back seat"; do not ask us to "ride for a fall," to "hurry up," or "boom it all we know." Nothing is more irritating in print than the iteration of slang, and those stale phrases with which "the half-baked" seek to convince us that they are "in the swim" and "going strong"—if I may borrow the language of the day—that Volapük of the smart and knowing world. It offends me like the reek of last night's tobacco.

It is a good rule for a young writer to avoid more than twenty or thirty words without a full stop, and not to put more than two commas in each sentence, so that its clauses should not exceed three. This, of course, only in practice. There is no positive law. A fine writer can easily place in a sentence one hundred words, and five or six minor clauses with their proper commas and colons. Ruskin was wont to toss off two or three hundred words and five-and-twenty commas without a pause. But even in the hand of such a magician this ends in failure, and is really grotesque in effect, for no such sentence can be spoken aloud. A beginner can seldom manage more than twenty-five words in one sentence with perfect ease. Nearly all young writers, just as men did in the early

ages of prose composition, drift into ragged, preposterous, inorganic sentences, without beginning, middle, or end, which they ought to break into two or three.

And then they hunt up terms that are fit for science, poetry, or devotion. They affect "evolution" and "factors," "the interaction of forces," "the co-ordination of organs"; or else everything is "weird," or "opalescent," "debonair," and "enamelled," so that they will not call a spade a spade. I do not say, stick to Saxon words and avoid Latin words as a law of language, because English now consists of both: good and plain English prose needs both. We seldom get the highest poetry without a large use of Saxon, and we hardly reach precise and elaborate explanation without Latin terms. Try to turn *precise and elaborate explanation* into strict Saxon; and then try to turn "Our Father, which art in heaven" into pure Latin words. No! current English prose — not the language of poetry or of prayer — must be of both kinds, Saxon and Latin. But wherever a Saxon word is enough, use it; because if it have all the fulness and the precision you need, it is the more simple, the more direct, the more homely.

Never quote anything that is not apt and new. Those stale citations of well-worn lines give us a cold shudder, as does a pun at a dinner-party. A familiar phrase from poetry or Scripture may pass when imbedded in your sentence. But to show it round as a nugget which you have just picked up is the innocent freshman's snare. Never imitate any writer, however good. All imitation in literature is a mischief, as it is in art. A great and popular writer ruins his followers and mimics, as did Raffaelle and Michel

Angelo; and when he founds a school of style, he impoverishes literature more than he enriches it. Johnson, Macaulay, Carlyle, Dickens, Ruskin have been the cause of flooding us with cheap copies of their special manner. And even now Meredith, Stevenson, Swinburne, and Pater lead the weak to ape their airs and graces. All imitation in literature is an evil. I say to you, as Mat Arnold said to me (who surely needed no such warning), "Flee Carlylese as the very devil!" Yes, flee Carlylese, Ruskinese, Meredithese, and every other *ese*, past, present, and to come. A writer whose style invites imitation so far falls short of being a true master. He becomes the parent of caricature, and frequently he gives lessons in caricature himself.

Though you must never imitate any writer, you may study the best writers with care. And for study choose those who have founded no school, who have no special and imitable style. Read Pascal and Voltaire in French; Swift, Hume, and Goldsmith in English; and of the moderns, I think, Thackeray and Froude. Ruskin is often too rhapsodical for a student; Meredith too whimsical; Stevenson too "precious," as they love to call it; George Eliot too laboriously enamelled and erudite. When you cannot quietly enjoy a picture for the curiosity aroused by its so-called "brushwork," the painting may be a surprising sleight-of-hand, but is not a masterpiece.

Read Voltaire, Defoe, Swift, Goldsmith, and you will come to understand how the highest charm of words is reached without your being able to trace any special element of charm. The moment you begin to pick out this or that felicity of phrase, this or that sound of music in the words, and directly it strikes you as

eloquent, lyrical, pictorial — then the charm is snapped. The style may be fascinating, brilliant, impressive; but it is not perfect.

Of melody in style I have said nothing; nor indeed can anything practical be said. It is a thing infinitely subtle, inexplicable, and rare. If your ear does not hear the false note, the tautophony or the cacophony in the written sentence, as you read it or frame it silently to yourself, and hear it thus inaudibly long before your eye can pick it forth out of the written words, nay, even when the eye fails to localize it by analysis at all — then you have no inborn sense of the melody of words, and be quite sure that you can never acquire it. One living Englishman has it in the highest form; for the melody of Ruskin's prose may be matched with that of Milton and Shelley. I hardly know any other English prose which retains the ring of that ethereal music — echoes of which are more often heard in our poetry than in our prose. Nay, since it is beyond our reach, wholly incommunicable, defiant of analysis and rule, it may be more wise to say no more.

Read Swift, Defoe, Goldsmith, if you care to know what is pure English. I need hardly tell you to read another and a greater Book. The Book which begot English prose still remains its supreme type. The English Bible is the true school of English literature. It possesses every quality of our language in its highest form — except for scientific precision, practical affairs, and philosophic analysis. It would be ridiculous to write an essay on metaphysics, a political article, or a novel in the language of the Bible. Indeed, it would be ridiculous to write anything at all in the language

of the Bible. But if you care to know the best that our literature can give in simple noble prose — mark, learn, and inwardly digest the Holy Scriptures in the English tongue.

IV

The Principle of Sincerity

By George Henry Lewes [1]

In all sincere speech there is power, not necessarily great power, but as much as the speaker is capable of. Speak for yourself and from yourself, or be silent. It can be of no good that you should tell in your "clever" feeble way what another has already told us with the dynamic energy of conviction. If you can tell us something that your own eyes have seen, your own mind has thought, your own heart has felt, you will have power over us, and all the real power that is possible for you. If what you have seen is trivial, if what you have thought is erroneous, if what you have felt is feeble, it would assuredly be better that you should not speak at all; but if you insist on speaking Sincerity will secure the uttermost of power.

1 This selection is reprinted from Chapter IV of G. H. Lewes' *Principles of Success in Literature,* first published as a series of papers in the *Fortnightly Review,* of which Lewes was editor, in 1865. George Henry Lewes, 1817–1878, was an English journalist and literary man who lived with Mary Ann Evans (George Eliot) as her husband from 1854 until his death in 1878. Lewes was a versatile and brilliant author of literary, dramatic, philosophical, and scientific works. Whatever the subject he dealt with he brought to it a large fund of good sense, vivacity and independence. Perhaps his best known works are his *Biographical History of Philosophy,* 1845–6, and his *Life and Works of Goethe,* 1855. He was a disciple of Comte and the Positivist philosophy alluded to in the note on Mr. Frederic Harrison above.—Editor.

The delusions of self-love cannot be prevented, but intellectual misconceptions as to the means of achieving success may be corrected. Thus although it may not be possible for any introspection to discover whether we have genius or effective power, it is quite possible to know whether we are trading upon borrowed capital, and whether the eagle's feathers have been picked up by us, or grow from our own wings. I hear some one of my young readers exclaim against the disheartening tendency of what is here said. Ambitious of success, and conscious that he has no great resources within his own experience, he shrinks from the idea of being thrown upon his naked faculty and limited resources, when he feels himself capable of dexterously using the resources of others, and so producing an effective work. "Why," he asks, "must I confine myself to my own small experience, when I feel persuaded that it will interest no one? Why express the opinions to which my own investigations have led me when I suspect that they are incomplete, perhaps altogether erroneous, and when I know that they will not be popular because they are unlike those which have hitherto found favor? Your restrictions would reduce two-thirds of our writers to silence!"

This reduction would, I suspect, be welcomed by every one except the gagged writers; but as the idea of its being operative is too chimerical for us to entertain it, and as the purpose of these pages is to expound the principles of success and failure, not to make Quixotic onslaughts on the windmills of stupidity and conceit, I answer my young interrogator: "Take warning and do not write. Unless you believe in yourself, only noodles will believe in you, and they but

tepidly. If your experience seems trivial to you, it must seem trivial to us. If your thoughts are not fervid convictions, or sincere doubts, they will not have the power of convictions and doubts. To believe in yourself is the first step; to proclaim your belief the next. You cannot assume the power of another. No jay becomes an eagle by borrowing a few eagle feathers. It is true that your sincerity will not be a guarantee of power. You may believe that to be important and novel which we all recognize as trivial and old. You may be a madman, and believe yourself a prophet. You may be a mere echo, and believe yourself a voice. These are among the delusions against which none of us are protected. But if Sincerity is not necessarily a guarantee of power, it is a necessary condition of power, and no genius or prophet can exist without it."

"The highest merit we ascribe to Moses, Plato, and Milton," says Emerson, "is that they set at nought books and traditions, and spoke not what men, but what *they* thought. A man should learn to detect and watch that gleam of light which flashes across his mind from within, more than the lustre of the firmament of bards and sages. Yet he dismisses without notice his thought because it is his. In every work of genius we recognize our own rejected thoughts; they come back to us with a certain alienated majesty." It is strange that any one who has recognized the individuality of all works of lasting influence, should not also recognize the fact that his own individuality ought to be steadfastly preserved. As Emerson says in continuation, "Great works of art have no more affecting lesson for us than this. They teach us to abide by our

spontaneous impression with good-humored inflexibility, then most when the whole cry of voices is on the other side. Else to-morrow a stranger will say with masterly good sense precisely what we have thought and felt all the time, and we shall be forced to take with shame our opinion from another."[1] Accepting the opinions of another and the tastes of another is very different from agreement in opinion and taste. Originality is independence, not rebellion; it is sincerity, not antagonism. Whatever you believe to be true and false, that proclaim to be true and false; whatever you think admirable and beautiful, that should be your model, even if all your friends and all the critics storm at you as a crotchet-monger and an eccentric. Whether the public will feel its truth and beauty at once, or after long years, or never cease to regard it as paradox and ugliness, no man can foresee; enough for you to know that you have done your best, have been true to yourself, and that the utmost power inherent in your work has been displayed.

An orator whose purpose is to persuade men must speak the things they wish to hear; an orator, whose purpose is to move men, must also avoid disturbing the emotional effect by any obtrusion of intellectual antagonism; but an author whose purpose is to instruct men, who appeals to the intellect, must be careless of their opinions, and think only of truth. It will often be a question when a man is or is not wise in advancing unpalatable opinions, or in preaching heresies; but it can never be a question that a man should be silent if

1 The citations from Emerson and Ruskin in this essay have been corrected in places where they were inexactly quoted in the *Fortnightly Review.*

unprepared to speak the truth as he conceives it. Deference to popular opinion is one great source of bad writing, and is all the more disastrous because the deference is paid to some purely hypothetical requirement. When a man fails to see the truth of certain generally accepted views, there is no law compelling him to provoke animosity by announcing his dissent. He may be excused if he shrink from the lurid glory of martyrdom; he may be justified in not placing himself in a position of singularity. He may even be commended for not helping to perplex mankind with doubts which he feels to be founded on limited and possibly erroneous investigation. But if allegiance to truth lays no stern command upon him to speak out his immature dissent, it does lay a stern command not to speak out hypocritical assent. There are many justifications of silence; there can be none of insincerity.

Nor is this less true of minor questions; it applies equally to opinions on matters of taste and personal feeling. Why should I echo what seem to me the extravagant praises of Raphael's 'Transfiguration,' when, in truth, I do not greatly admire that famous work? There is no necessity for me to speak on the subject at all; but if I do speak, surely it is to utter my impressions, and not to repeat what others have uttered. Here, then, is a dilemma; if I say what I really feel about this work, after vainly endeavoring day after day to discover the transcendent merits discovered by thousands (or at least proclaimed by them), there is every likelihood of my incurring the contempt of connoisseurs, and of being reproached with want of taste in art. This is the bugbear which scares thou-

sands. For myself, I would rather incur the contempt of connoisseurs than my own; the reproach of defective taste is more endurable than the reproach of insincerity. Suppose I *am* deficient in the requisite knowledge and sensibility, shall I be less so by pretending to admire what really gives me no exquisite enjoyment? Will the pleasure I feel in pictures be enhanced because other men consider me right in my admiration, or diminished because they consider me wrong?[1]

The opinion of the majority is not lightly to be rejected; but neither is it to be carelessly echoed. There is something noble in the submission to a great renown, which makes all reverence a healthy attitude if it be genuine. When I think of the immense fame of Raphael, and of how many high and delicate minds have found exquisite delight even in the 'Transfiguration,' and especially when I recall how others of his works have affected me, it is natural to feel some diffidence in opposing the judgment of men whose studies have given them the best means of forming that judgment — a diffidence which may keep me silent on the matter. To start with the assumption that you are right, and all who oppose you are fools, cannot be a safe method. Nor in spite of a conviction

1 I have never thoroughly understood the painful anxiety of people to be shielded against the dishonoring suspicion of not rightly appreciating pictures, even when the very phrases they use betray their ignorance and insensibility. Many will avow their indifference to music, and almost boast of their ignorance of science; will sneer at abstract theories, and profess the most tepid interest in history, who would feel it an unpardonable insult if you doubted their enthusiasm for painting and the "old masters" (by them secretly identified with the brown masters). It is an insincerity fostered by general pretense. Each man is afraid to declare his real sentiments in the presence of others equally timid. Massive authority overawes genuine feeling.

that much of the admiration expressed for the 'Transfiguration' is lip-homage and tradition, ought the non-admiring to assume that all of it is insincere. It is quite compatible with modesty to be perfectly independent, and with sincerity to be respectful to the opinions and tastes of others. If you express any opinion, you are bound to express your real opinion; let critics and admirers utter what dithyrambs they please. Were this terror of not being thought correct in taste once got rid of, how many stereotyped judgments on books and pictures would be broken up! and the result of this sincerity would be some really valuable criticism. In the presence of Raphael's 'Sistine Madonna,' Titian's 'Peter the Martyr,' or Masaccio's great frescoes in the Brancacci Chapel, one feels as if there had been nothing written about these mighty works, so little does any eulogy discriminate the elements of their profound effects, so little have critics expressed their own thoughts and feelings. Yet every day some wandering connoisseur stands before these pictures, and at once, without waiting to let them sink deep into his mind, discovers all the merits which are stereotyped in the criticisms, and discovers nothing else. He does not wait to feel, he is impatient to range himself with men of taste; he discards all genuine impressions, replacing them with vague conceptions of what he is expected to see.

Inasmuch as success must be determined by the relation between the work and the public, the sincerity which leads a man into open revolt against established opinions may seem to be an obstacle. Indeed, publishers, critics, and friends are always loud in their prophecies against originality and independence on this

very ground; they do their utmost to stifle every attempt at novelty, because they fix their eyes upon a hypothetical public taste, and think that only what has already been proved successful can again succeed; forgetting that whatever has once been done need not be done over again, and forgetting that what is now commonplace was once originality. There are cases in which a disregard of public opinion will inevitably call forth opprobrium or neglect; but there is no case in which Sincerity is not strength. If I advance new views in Philosophy or Theology, I cannot expect to have many adherents among minds altogether unprepared for such views; yet it is certain that even those who most fiercely oppose me will recognize the power of my voice if it is not a mere echo; and the very novelty will challenge attention, and at last gain adherents if my views have any real insight. At any rate the point to be considered is this, that whether the novel views excite opposition or applause, the one condition of their success is that they be believed in by the propagator. The public can only be really moved by what is genuine. Even an error if believed in will have greater force than an insincere truth. Lip-advocacy only rouses lip-homage. It is belief which gives momentum.

Nor is it any serious objection to what is here said, that insincerity and timid acquiescence in the opinion and tastes of the public do often gain applause and temporary success. Sanding the sugar is not immediately unprofitable. There is an unpleasant popularity given to falsehood in this world of ours; but we love the truth notwithstanding, and with a more enduring love. Who does not know what it is to listen to public

speakers pouring forth expressions of hollow belief and sham enthusiasm, snatching at commonplaces with a fervor as of faith, emphasizing insincerities as if to make up by emphasis what is wanting in feeling, all the while saying not only what they do not believe, but what the listeners *know* they do not believe, and what the listeners, though they roar assent, do not themselves believe — a turbulence of sham, the very noise of which stuns the conscience? Is such an orator really enviable, although thunders of applause may have greeted his efforts? Is that success, although the newspapers all over the kingdom may be reporting the speech ? What influence remains when the noise of the shouts has died away? Whereas, if on the same occasion one man gave utterance to a sincere thought, even if it were not a very wise thought, although the silence of the public — perhaps its hisses — may have produced an impression of failure, yet there is success, for the thought will reappear and mingle with the thoughts of men to be adopted or combated by them, and may perhaps in a few years mark out the speaker as a man better worth listening to than the noisy orator whose insincerity was so much cheered.

The same observation applies to books. An author who waits upon the times, and utters only what he thinks the world would like to hear, who sails with the stream, admiring everything which it is "correct taste" to admire, despising everything which has not yet received that Hall-mark, sneering at the thoughts of a great thinker not yet accepted as such, and slavishly repeating the small phrases of a thinker who has gained renown, flippant and contemptuous towards

opinions which he has not taken the trouble to understand, and never venturing to oppose even the errors of men in authority, such an author may indeed by dint of a certain dexterity in assorting the mere husks of opinion gain the applause of reviewers, who will call him a thinker, and of indolent men and women who will pronounce him "so clever"; but triumphs of this kind are like oratorical triumphs after dinner. Every autumn the earth is strewed with the dead leaves of such vernal successes.

I would not have the reader conclude that because I advocate plain-speaking even of unpopular views, I mean to imply that originality and sincerity are always in opposition to public opinion. There are many points both of doctrine and feeling in which the world is not likely to be wrong. But in all cases it is desirable that men should not pretend to believe opinions which they really reject, or express emotions they do not feel. And this rule is universal. Even truthful and modest men will sometimes violate the rule under the mistaken idea of being eloquent by means of the diction of eloquence. This is a source of bad Literature. There are certain views in Religion, Ethics, and Politics, which readily lend themselves to eloquence, because eloquent men have written largely on them, and the temptation to secure this facile effect often seduces men to advocate these views, in preference to views they really see to be more rational. That this eloquence at second-hand is but feeble in its effect, does not restrain others from repeating it. Experience never seems to teach them that grand speech comes only from grand thoughts, passionate speech from pas-

sionate emotions. The pomp and roll of words, the trick of phrase, the rhythm and the gesture of an orator, may all be imitated, but not his eloquence. No man was ever eloquent by trying to be eloquent, but only by being so. Trying leads to the vice of "fine writing" — the plague-spot of Literature, not only unhealthy in itself, and vulgarizing the grand language which should be reserved for great thoughts, but encouraging that tendency to select only those views upon which a spurious enthusiasm can most readily graft the representative abstractions and stirring suggestions which will move public applause. The "fine writer" will always prefer the opinion which is striking to the opinion which is true. He frames his sentences by the ear, and is only dissatisfied with them when their cadences are ill-distributed, or their diction is too familiar. It seldom occurs to him that a sentence should accurately express his meaning and no more; indeed there is not often a definite meaning to be expressed, for the thought which arose vanished while he tried to express it, and the sentence, instead of being determined by and moulded on a thought, is determined by some verbal suggestion. Open any book or periodical, and see how frequently the writer does not, cannot, mean what he says; and you will observe that in general the defect does not arise from any poverty in our language, but from the habitual carelessness which allows expressions to be written down unchallenged provided they are sufficiently harmonious, and not glaringly inadequate.

The slap-dash insincerity of modern style entirely sets at nought the first principle of writing, which is accuracy. The art of writing is not, as many seem

to imagine, the art of bringing fine phrases into rhythmical order, but the art of placing before the reader intelligible symbols of the thoughts and feelings in the writer's mind. Endeavor to be faithful, and if there is any beauty in your thought, your style will be beautiful; if there is any real emotion to express, the expression will be moving. Never rouge your style. Trust to your native pallor rather than to cosmetics. Try to make us see what you see and to feel what you feel, and banish from your mind whatever phrases others may have used to express what was in their thoughts, but is not in yours. Have you never observed what a slight impression writers have produced, in spite of a profusion of images, antitheses, witty epigrams, and rolling periods, whereas some simpler style, altogether wanting in such "brilliant passage," has gained the attention and respect of thousands? Whatever is stuck on as ornament affects us as ornament; we do not think an old hag young and handsome because the jewels flash from her brow and bosom; if we envy her wealth, we do not admire her beauty.

What "fine writing" is to prosaists, insincere imagery is to poets: it is introduced for effect, not used as expression. To the real poet an image comes spontaneously, or if it comes as an afterthought, it is chosen because it expresses his meaning and helps to paint the picture which is in his mind, not because it is beautiful in itself. It is a symbol, not an ornament. Whether the image rise slowly before the mind during contemplation, or is seen in the same flash which discloses the picture, in each case it arises by natural association, and is *seen*, not *sought*. The inferior poet is dissatisfied with what he sees, and casts about in

search after something more striking. He does not wait till an image is borne in upon the tide of memory, he seeks for an image that will be picturesque; and being without the delicate selective instinct which guides the fine artist, he generally chooses something which we feel to be not exactly in its right place. He thus—

> "With gold and silver covers every part,
> And hides with ornament his want of art."

Be true to your own soul, and do not try to express the thought of another. "If some people," says Ruskin, "really see angels where others see only empty space, let them paint the angels: only let not anybody else think *he* can paint an angel too, on any calculated principles of the angelic." Unhappily this is precisely what so many will attempt, inspired by the success of the angelic painter. Nor will the failure of others warn them.

Whatever is sincerely felt or believed, whatever forms part of the imaginative experience, and is not simply imitation or hearsay, may fitly be given to the world, and will always maintain an infinite superiority over imitative splendor; because although it by no means follows that whatever has formed part of the artist's experience must be impressive, or can do without artistic presentation, yet his artistic power will always be greater over his own material than over another's. Emerson has well remarked that "those facts, words, persons, which dwell in a man's memory without his being able to say why, remain, because they have a relation to him not less real for being as yet unapprehended. They are symbols of value to him,

as they can interpret parts of his consciousness which he would vainly seek words for in the conventional images of books and other minds. What attracts my attention shall have it, as I will go to the man who knocks at my door, while a thousand persons as worthy go by it, to whom I give no regard. It is enough that these particulars speak to me. A few anecdotes, a few traits of character, manners, face, a few incidents, have an emphasis in your memory out of all proportion to their apparent significance if you measure them by the ordinary standards. They relate to your gift. Let them have their weight, and do not reject them, and cast about for illustrations and facts more usual in literature."

In the notes to the last edition of his poems, Wordsworth specified the particular occasions which furnished him with particular images. It was the things he had *seen* which he put into his verses; and that is why they affect us. It matters little whether the poet draws his images directly from present experience, or indirectly from memory — whether the sight of the slow-sailing swan, that "floats double, swan and shadow" be at once transferred to the scene of the poem he is writing, or come back upon him in after years to complete some picture in his mind; enough that the image be suggested, and not sought.

The sentence from Ruskin, quoted just now, will guard against the misconception that a writer, because told to rely on his own experience, is enjoined to forego the glory and delight of creation even of fantastic types. He is only told never to pretend to see what he has not seen. He is urged to follow Imagination in her most erratic course, though like a will-o'-

wisp she lead over marsh and fen away from the haunts of mortals; but not to pretend that he is following a will-o'-wisp when his vagrant fancy never was allured by one. It is idle to paint fairies and goblins unless you have a genuine vision of them which forces you to paint them. They are poetical objects, but only to poetic minds. "Be a plain topographer if you possibly can," says Ruskin, "if Nature meant you to be anything else, she will force you to it; but never try to be a prophet; go on quietly with your hard camp-work, and the spirit will come to you in the camp, as it did to Eldad and Medad, if you are appointed to have it." Yes: if you are appointed to it; if your faculties are such that this high success is possible, it will come, provided the faculties are employed with sincerity. Otherwise it cannot come. No insincere effort can secure it.

If the advice I give to reject every insincerity in writing seem cruel, because it robs the writer of so many of his effects — if it seem disheartening to earnestly warn a man not to *try* to be eloquent, but only to *be* eloquent when his thoughts move with an impassioned *largo* — if throwing a writer back upon his naked faculty seem especially distasteful to those who have a painful misgiving that their faculty is small, and that the uttermost of their own power would be far from impressive, my answer is that I have no hope of dissuading feeble writers from the practice of insincerity, but as under no circumstances can they become good writers and achieve success, my analysis has no reference to them, my advice has no aim at them.

It is to the young and strong, to the ambitious and

the earnest, that my words are addressed. It is to wipe the film from their eyes, and make them see, as they will see directly the truth is placed before them, how easily we are all seduced into greater or less insincerity of thought, of feeling, and of style, either by reliance on other writers, from whom we catch the trick of thought and turn of phrase, or from some preconceived view of what the public will prefer. It is to the young and strong I say: Watch vigilantly every phrase you write, and assure yourself that it expresses what you mean; watch vigilantly every thought you express, and assure yourself that it is yours, not another's; you may share it with another, but you must not adopt it from him for the nonce. Of course, if you are writing humorously or dramatically, you will not be expected to write your own serious opinions. Humor may take its utmost license, yet be sincere. The dramatic genius may incarnate itself in a hundred shapes, yet in each it will speak what it feels to be the truth. If you are imaginatively representing the feelings of another, as in some playful exaggeration or some dramatic personation, the truth required of you is imaginative truth, not your personal views and feelings. But when you write in your own person you must be rigidly veracious, neither pretending to admire what you do not admire, or to despise what in secret you rather like, nor surcharging your admiration and enthusiasm to bring you into unison with the public chorus. This vigilance may render Literature more laborious; but no one ever supposed that success was to be had on easy terms; and if you only write one sincere page where you might have written twenty insincere pages, the one page is worth writing—it is Literature.

Sincerity is not only effective and honorable, it is also much less difficult than is commonly supposed. To take a trifling example: If for some reason I cannot, or do not, choose to verify a quotation which may be useful to my purpose, what is to prevent my saying that the quotation is taken at second-hand? It is true, if my quotations are for the most part second-hand and are acknowledged as such, my erudition will appear scanty. But it will only appear what it is. Why should I pretend to an erudition which is not mine? Sincerity forbids it. Prudence whispers that the pretense is, after all, vain, because those, and those alone, who can rightly estimate erudition will infallibly detect my pretense, whereas those whom I have deceived were not worth deceiving. Yet in spite of Sincerity and Prudence, how shamelessly men compile second-hand references, and display in borrowed foot-notes a pretense of labor and of accuracy! I mention this merely to show how, even in the humbler class of compilers, the Principle of Sincerity may find fit illustrations, and how honest work, even in references, belongs to the same category as honest work in philosophy or poetry.

V

The Value of English to the Technical Man

By John Lyle Harrington[1]

LANGUAGE is an instrument, a medium for the exchange of thought. If, in individual instances, both speaker and hearer employ words in the same sense and arrange them in the same manner, the expressed ideas will be perfectly understood, whether the language be in accordance with good usage or not. But, if

1 This address was first delivered by Mr. Harrington in 1907 to the Technological Society of Kansas City, the Engineering Society of the University of Missouri, and the Civil Engineering Society of the University of Kansas. It was printed in pamphlet form and afterwards included in the stimulating and idealistic volume of *Addresses to Engineering Students* edited and published by Messrs. Waddell and Harrington at Kansas City, which is familiar to many students in technical schools and should be to all. The address is reprinted here by kind permission of the author.

John Lyle Harrington was born in 1868, educated at the University of Kansas and McGill University, Montreal, and is now practising as a consulting engineer in Kansas City. He has devoted a good deal of unselfish effort to the betterment of engineering education. The seriousness with which practical engineers view the problem of English instruction is shown by the following sentence printed by the editors of the *Engineering Addresses* before this essay: "Upon whether its teachings be followed or ignored may depend the success or failure of any technical student to attain in after life the highest rank in the engineering profession. Possessing a mastery of the English language, he may or may not rise to eminence; but without it, he certainly cannot. Any engineering student who wilfully neglects the study of his own language deserves the failure to attain eminence which assuredly will be his fate."—EDITOR.

thought is to be conveyed without loss to a larger audience, the medium must be substantially perfect. Words must not only be used in accordance with their accustomed and generally accepted meanings, and with all the shades and niceties of those meanings, but they must be arranged in accordance with the accepted construction of phrase, clause, and sentence; and the whole argument or thesis must be so ordered with regard to the sequence and the relations of the various ideas that the hearer shall be compelled to understand. Discourses in which thoughts, though they be ever so clearly expressed, are not arranged in logical order, will fail in their purpose, because the argument is confused and the mind of the hearer is occupied with the language instead of the substance of the thought. You will recall Sam Weller's remark regarding Mr. Nupkins' eloquence that "his ideas come out so fast they knock each other's heads off and you can't tell what he is driving at." Like any other instrument, the value of language is in direct proportion to our knowledge of it and our skill in its use. If we understand it fully and use it skillfully it will serve our purpose well, but if we are novices and bunglers, only disappointment will result.

Language, though it will not supply the place of thought, is a most essential instrument to every man. To him who is without important thought to express, it is not a very valuable tool. The laborer does not require it in handling the pick and shovel; it is only in his social relations that he has much need for speech. It is not important that the stoker speak fluently, or that the mechanic be an able orator or writer. But as we proceed from the lower to the higher

and more intellectual occupations, the need and the value of knowledge and command of language rapidly increase. The politician, we sometimes think, makes skillful use of language to hide his thought, or to dissemble. Indeed, in all walks of life there are times when words are well employed to obscure the thought. But the physician must be skillful in the use of language in order to direct and control his patients, as well as to write, and to understand the writings of his fellow physicians. The clergyman needs it to please, to inform, to convince, and to persuade his auditors. But the technical man, that is, the engineer, the architect, and the applied scientist of every kind, finds a sound, accurate knowledge of the language essential to him in every part of his work. A wide and precise knowledge of words is required in his reading as well as in his general writing; in his business and professional conversations even more than in those of a social nature. But, in the preparation and interpretation of technical correspondence, specifications, and contracts, the use of perfect language reaches the highest degree of importance. The lawyer alone needs to be so much of a precisian, and he attains that end by very awkward and cumbersome means.

The technical man of the highest order is not only a cultured gentleman, versed in all the amenities of polite society, familiar with the best literature in his own language and probably in that of one or two others, able to read many branches of learning understandingly and to discuss them intelligently; but, in addition, he has special knowledge of mathematics and the applied sciences, and he is not only able to understand what is written or spoken but can express his own

thought regarding them readily, accurately, and logically. The successful technical man, it has been well said, must know much about everything and everything about something, but his ideas and knowledge are of small value except in so far as he can convey them to others; for, since he does not often labor with his hands, he must instruct and direct those who do. Thus, language is his most important tool, and it certainly behooves him to see that it is always in good order. His reputation as a gentleman and as a professional man depends very largely upon his knowledge and use of English.

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Technical men are peculiarly prone to offend in the use of their mother-tongue, because they have not, as a rule, read deeply in classical literature nor been instructed thoroughly in the construction of the language. Their higher education is generally almost entirely technical. Most of the engineering schools now require for matriculation substantially the same subjects that the colleges do, but some of the best still admit students with little more than a grammar school education, supplemented by the rudiments of the natural sciences and elementary mathematics. Cultural subjects are never required to any great extent, and they cannot be taught in the course. The curriculum is already well filled with scientific, mathematical, and technical subjects, and there is not room for a deep study of literature and the languages. The technical man who has a thorough knowledge of English has had the wisdom and patience to supplement his technical education by an arts course, has read widely of classic literature, or possesses the rare gift of lan-

guage. Long continued and intimate association with those who employ excellent English will ensure reasonably good usage, in fact such association is almost essential, no matter what the education may be; but the knowledge of the language so acquired generally breaks down when it is applied to technical matters in which extreme accuracy is a requisite and in which the terms differ much from those used in ordinary conversation. There is no royal road to a knowledge of technical English.

Some of our better universities are now offering a six-years' course which combines the usual arts and technical courses, each of which ordinarily occupies four years, but which have many subjects in common. This is a decided step in the right direction, for technical men generally are coming into a more complete realization of their deficiencies and are insisting that young technists be more liberally educated. The professional man does not always remain a technist, in fact he frequently becomes a man of affairs as well, where a liberal education is even more essential than in his purely technical work.

Before passing to a consideration of the specific advantages enjoyed by the technical man who uses good English, let us glance at some of the grosser faults of which so many are guilty, for there is no better way to attain a comprehension of the good than by contrasting it with the bad. It has been well said that it is no virtue to speak good English, but that it is a disgrace to use bad English. The upright man does not feel the burden of the law, but to the criminal it is oppressive.

You will say that it is absurd to state that men

who have graduated from any college cannot spell correctly, but many of them cannot. *S-e-d,* said, *p-e-a-r,* pier, are extreme but true examples. It is very common to find misspelled words in letters written by young engineers. They consider such errors of no material consequence, because they are not technical errors. The mind has been so fixed upon the scientific work during the course of study, and while the early experience is being acquired, that such matters as language and culture seem to be of little importance. But the recipient of the letter generally takes a different view of the matter, for he justly considers the writer something of an ignoramus.

Errors of orthography and orthoepy are both due to unpardonable carelessness and ignorance, for any one can learn to spell and to pronounce correctly, and no man should be given a degree or a diploma by any institution of learning unless he does so habitually.

Grossly bad grammar is also very common. It generally arises from carelessness in ordering the thought and speech rather than from lack of knowledge of correct usage, but it is frequently attributed to ignorance, and certainly the penalty is not too severe. In many instances, however, ignorance is the true cause of the error. The study of grammar commonly ceases when the student leaves the graded schools. Thereafter, he assumes that his knowledge of the subject is full and complete and that he need give it no further attention, notwithstanding the fact that his capacity for thought and the need of means for its expression continue to increase. His vocabulary grows; but his knowledge of the fundamental principles which govern its use not only does not expand as his needs require, but it

is allowed to become uncertain and to diminish through lack of exercise. When the matter is thought of at all, it is assumed that in some vague, uncertain way habit will serve, instead of knowledge and understanding. The grammar is put away, like other childish things.

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But the highest skill in the use of language is not attained when our words are properly spelled or pronounced and our sentences formed in accordance with the rules of grammar. In fact these are only bare and absolute essentials — the skeleton of our language which must still be provided with flesh and blood and nerves before it will live and fulfill its mission. The whole purpose for which language is employed is to impress our thought upon others in such a way that they shall feel or think or act as we desire. To attain this end it is essential that we make intelligent use of the arts of rhetoric and oratory, that we know the laws of composition, the methods of ordering and constructing our discourse so that it will lead the minds of our hearers wherever we wish, and not only convey our thought but induce our auditors to think along the lines that will benefit our purpose.

The style of the discourse must be pleasing and suited to the object. Especially for the technical man's purpose, it should be crisp and clear. An elegant, showy style weakens the discourse and is wholly undesirable except where immediate oratorical effect is sought. . . . Short words of English origin are invariably stronger and more rugged than their longer and more elegant synonyms which are derived from the Latin or Greek; hence their use is nearly always

to be preferred except where the subject matter is abstruse or where nice distinctions in meaning are important. Then the Greek and Latin derivatives are frequently the more serviceable. But simplicity and force demand simple, direct language. The style should be so smooth and so unostentatious that the hearer's attention is not drawn to the language, but is left entirely free to follow the course of the thought.

It is deplorably rare to find young technical men in possession of an intimate knowledge of rhetoric. Business correspondence is often annoyingly protracted because one or both of the parties conducting it ignore the simple law of unity and fail to round out and complete the subject under discussion. Errors of style and gross errors of composition are quite as frequent in the correspondence of the technically educated man as they are in that of the ordinary clerk who went to work when he left the grammar school. It is because engineers are so little accustomed to order their thought and language properly that they have so little part in the business and correspondence of the corporations which employ them. It is notorious that a technist is rarely a good business man. This is partly because of the exaggerated importance he gives to technical matters, but very largely because his thought is clumsily expressed and awkwardly ordered.

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The character of the technical man's language is important in his social and business intercourse; in his business and professional correspondence; in the promulgation of orders, rules, and regulations for the guidance of those under his direction; in the prepara-

tion of specifications, contracts, and reports; in writing and delivering addresses and technical papers; and in writing technical books for the advancement of his profession.

In conversation, earnestness and force may, in some measure, counteract the evil influence of bad English; but, since less care is commonly given to the spoken word than to the written, the results of bad habits of speech are much the same in either case; and in moments of special interest or excitement the habitual language is employed. Speech is usually heard but once, therefore its errors are much more likely to pass unnoticed than those which are written and may be read repeatedly; and the audience of the speaker is much more limited than that of the writer; therefore it would seem less important to speak than to write correctly. But it must not be forgotten that in conversation there is no time, as a rule, to give thought to the form of speech; and that all the errors one is accustomed to make are liable to occur. The habit of using good English should be so firmly fixed that one is not conscious of it.

A technical man is, presumably, an educated man; and if he do not speak like one, suspicion is cast upon the entire range of his learning. When a man cannot spell correctly, or use ordinarily good grammar (and there are many university men who cannot) it is difficult to convince others that he is professionally able. The great majority of technical men occupy salaried positions in the organizations of railways, governments, constructing companies, and manufacturing corporations. These positions are obtained by means of acquaintances made in a social way, by interview, by

correspondence, or on account of an earned reputation. Yet I have granted interviews to many technical men who spoke like laborers, and have received hundreds of letters from them that would be a disgrace to a grammar school scholar. There are technically educated men who say "I have saw," "I seen," and "I done"; and there are men in high places who require no further proof of the speaker's deep ignorance, not only of English but of technical matters as well. One who is thus ignorant of the language finds social progress substantially impossible. This may seem a trivial matter and foreign to our purpose, but it is not. Matters of very large importance are often settled by favor, and favor frequently follows social position. Other things being equal, almost anyone will show his friend the preference in business or professional matters. It is even common to stretch a point in favor of a friend.

Language has large weight in classifying a man, infinitely more than manner or dress. It exhibits his breeding and indicates his social status. I do not mean that it shows whether he belongs to the so-called "Smart Set," but whether he is of the educated, cultured class, whether you would care to entertain him at all, and, if so, whether you would send him to your less or more select club, or whether you may extend the extreme courtesy of inviting him to your home. This may appear at first glance to be of small consequence; but great things often result from associations quickly formed. In fact, such social relations make largely for success or failure in the business or professional world. Many have received the opportunity which led to eminence through the recommen-

dation of a casual acquaintance who was favorably impressed.

There are many vocations in which it is not essential that a man be cultured and intelligent; but the technical professions are not among them. Nothing so surely marks a man's secret habits of thought, his real character, as the little tricks of speech which are exhibited when his mind is upon the matter rather than the manner of his speech. If his thought be habitually coarse, crude, or brutal, his speech will make the fact manifest at times; and the speech of a moment frequently produces a permanent and vital effect.

In business correspondence the value of good usage is still more manifest than in conversation, since the written word is permanent, and correspondence greatly extends the field of one's intercourse. A letter very probably passes through many hands and multiplies the good or bad impressions of the writer it produces. If its import is not clear, it may cause disagreement or involve serious financial disadvantage to the writer. Even bad punctuation will often seriously alter the entire meaning of a sentence, and particularly bad grammar at once stamps a writer as being more or less of an ignoramus. The art of letter writing, like a knowledge of grammar, is commonly considered to be within the range of everyone's learning and skill; but anyone who has had large experience in business correspondence knows that few men write good letters. It is so rare to find a matter which is composed of more than one or two items, clearly, concisely, and thoroughly discussed in a letter that favorable attention is immediately attracted to its writer. Not a few men owe the opportunity for advancement to their

ability to write a good letter. Even though one be thoroughly versed in his subject and his discourse be well worth the time and attention of men of affairs, bad grammar will cast such suspicion over his whole equipment of learning that his argument will often be put aside without substantial consideration. Bad grammar is not a bar to the acquisition of money, but it substantially prohibits the acquisition of high position in the scientific world.

The detrimental results of bad English in conversation or in correspondence are by no means so certain as in the more formal technical papers. In the preparation of articles for the technical press, and papers for the learned societies, there is time to study form and style and to eliminate errors due to haste; hence, when such matters are ill written, it is not unfairly argued that the writer is ignorant of the correct use of the language. Such an opinion, widely disseminated, as it is likely to be when it originates thus, is exceedingly detrimental to the writer. It weakens his arguments, causes him to be misunderstood, or so detracts from the interest of his readers that the matter is not read. The idea that a technical paper is dry at best, and that the English employed in it is of small consequence has long been proved incorrect. There is so much nowadays that is well written that no busy professional man is willing to spare the extra time and effort necessary to read and digest an ill written paper.

A merchant may advertise his wares, a manufacturer his product, but reasonable modesty and his code of ethics prevent a professional man from advertising his skill. If he does not become known by his work or

his writings, he remains in comparative obscurity. His ability is clearly exposed in his writings, in which he gives to the profession his best thought; and if he cannot write easily and well he will probably not write at all, for the censorship of the learned societies is now severe and is rapidly growing more so. Every normal, healthy-minded technical man desires to leave a permanent record of the results of his best thought and work to aid his co-workers and those who come after him. An ably written description of work performed, discoveries made, or methods developed accomplishes more for the advancement of science than many well designed and well executed constructions. The latter benefit those who see them; the former may help all who can read.

Provoking and expensive errors often arise from the misunderstanding of badly expressed orders, rules, and regulations. In large corporations, especially in railway, contracting, and engineering companies where employees are distributed over a wide area, it is impossible for an officer to give individual instructions, or to see personally that they are carried out; hence, general instructions must be so clear that they cannot be misunderstood or evaded. It is hardly necessary to say that the consequences of a mistake in train orders, in instructions regarding breaking track for repairs or renewals, or for making temporary construction to span washouts, may result in expensive and fatal accidents. And even minor errors, oft repeated, may prove very costly.

But the preparation of reports, specifications, and contracts is the most particular and momentous task the technical man has to perform. A misused word,

a phrase whose meaning is ambiguous, a paragraph that is confused, or the omission of a direction or a precaution, may result in great damage, to both the client and the technical man. It is not enough to be careful in a general way. Every word, every phrase, every sentence, has a direct and vital bearing on the work governed by the documents. I have known the presence in a contract of a single word of equivocal meaning to cost one of the parties many thousands of dollars, though when the contract was drawn there was no question regarding the intent of the parties to it. Probably the majority of the civil lawsuits are caused not by trickery or deceit or dishonesty, but by the use of ambiguous words and phrases, bad ordering of the matter, incompleteness, and other faults in the language of the correspondence, specifications, and contracts. There is no more certain way for the engineer to protect his own and his client's interests than to prepare all documents in accordance with the best English usage as well as with technical skill; and there is no surer way to lay the foundation for trouble and financial loss than to neglect the character of his language.

Notwithstanding the vital importance of clear, concise, and full expression in such documents, it is not uncommon to find specifications and contracts so bad in their construction that they fail utterly in their purpose. Let me quote an illustration from the specifications, prepared by an architectural firm of some repute, for the construction of a building which cost nearly one hundred thousand dollars.

"Material and Workmanship. The entire frame work, columns, beams, etc., as indicated by the fram-

ing plans, or as specified, is to be of wrought steel, of quality hereinafter designated, all materials to be provided and put in place by this contractor. All work to be done in a neat and skillful manner, and is to guarantee the construction and workmanship with a bond equal to amount of tender for a term of five years, satisfactory to the proprietor and architects, to properly carry or support the loads it is designated to carry, namely its own weight, the weight of the several floors, roof and walls resting thereon, a 10,000 gravity tank, and the pressure of any wind which may not be designated a hurricane, and future three stories. . . . The floor beams are to be calculated for a maximum load of 150 lbs. to the sq. ft. (using C type IV of the Clinton Fire-Proof system, of Clinton, Mass.). The columns are to be calculated for a vertical load above mentioned and for horizontals and wind pressure and snow pressure, also roof. The whole to be calculated heavy enough for three additional stories on building should they be put on at any time, with connections at top columns to receive future columns. The columns on ground floor supporting front to be calculated in same proportion with all the rods necessary where shown. The whole of the columns to be one size throughout, those that carry more weight reinforced, and all columns to be kept as small as possible in proper construction. Each column to have ⅜-inch holes bored or punched every 4 ft. 6 in. in height on each corner (for use of other trades to fasten metal lath)."

The building was constructed under these specifications, not according to them; that would be impossible. But it is hardly necessary to say that the proprietors

interested were not safe-guarded. The wretched paragraphs quoted are no worse than a contractor finds in specifications almost every day, for they are composed, as a large number of engineers and architects compose their specifications, by copying and combining sentences or paragraphs from various sources, instead of by writing them from fundamental knowledge of the construction desired. In such instances the client is protected infinitely more by the honesty, knowledge, and skill of the contractor than by those of the architect.

Very few railway specifications for complicated structures are so well written that a contractor cannot comply with them to the letter, yet give the company construction far inferior to what the writer of the specifications intended, and thereby gain for himself material advantage.

The lawyers and the courts are kept busy rectifying the blunders of other professional men who do ill what they are paid to do well. I know of one contractor who has grown gray in the business of constructing buildings, who has never completed a contract without a lawsuit, and who has never lost a lawsuit. This speaks ill for the work of the architects under whom he worked, yet they are probably no worse than their fellows. If it were not good policy to be reasonably honest, many another contractor might easily approach his record.

It would appear that we have given more attention to bad than to good English. This is not illogical, for, manifestly, if the bad be eliminated the good will remain; and if the evils arising from the abuse of the language be fully comprehended, there will certainly

be serious endeavor to improve the usage. The laws of the language are commonly violated from mere carelessness. Slang and provincialisms creep into the speech and destroy its force and elegance; the expression becomes slovenly and the thought obscure; and what constitutes good English is forgotten unless reasonable attention is paid to the speech.

. . . . . .

Language itself is merely an instrument. Beautiful English does not constitute a meritorious discourse. The speaker or writer who uses language correctly and fluently but expresses no important thought is a failure; for the sole service good English can render is to convey the speaker's thought and purpose fully and accurately to the minds of his auditors. But this service alone will amply repay years of study and a life of care and attention to the use of the English language.

VI

The Standard of Usage

By Thomas R. Lounsbury [1]

In his life of Story, Mr. Henry James mentions the presence of the sculptor at a dinner given in London by the critic and essayist John Forster. During the course of it the talk chanced to turn upon a letter from Hampden to Sir John Elliot which had been read. The peculiar beauty of its expression struck all present. Story observed that the English language seemed no longer to have its old elegance. This remark led to an outburst from the host. "As soon," said Forster, "as grammar is printed in any language,

1 This essay is taken from *The Standard of Usage in English*, by Thomas R. Lounsbury, copyright, 1907, 1908, by Harper and Brothers, and is reproduced here by special arrangement with that firm. Thomas R. Lounsbury, 1838–1915, served actively for twenty-five years as Professor of English in Yale University, and is the author of important works in literary history and philology. This essay and the book from which it is taken are especially noteworthy as expressing in popular form the principles of usage recognized by authorities on language but violated often by purists and pedantic teachers, who, in their anxiety for correctness, tend to go to the other extreme and to curtail the legitimate resources and variety of the English language. Questions of usage are clear enough as to principle but difficult in practice: they are to be mastered not mainly by reference to grammars and rhetorics and dictionaries, but by observation of the practice of standard authors: it is much easier to make a positive statement, based on one's reading, as to what is good, than to make the negative one, as to what is not. All of which indicates that instruction in language is not only more profitable but also more likely to be sound if it is positive rather than negative in character.—Editor.

it begins to go. The Greeks had no grammar when their best works were written, and the decline of style began with the appearance of one."

Forster has not been the only one to take this view, nor was he the first to give it utterance. Extravagantly stated as it is, there is in it a certain element of truth. The early authors of a tongue have in their minds no thought of possible censure from any linguistic critic. Every one does what is right in his own eyes, restrained, so far as he is restrained, only by that sense of propriety which genius possesses as its birthright and great talents frequently acquire. But in later times, when grammars and manuals of usage have come to abound, there is frequent consultation of them, or, rather, a constant dread of violating rules which they have promulgated. Such a method of proceeding is not conducive to the best results in the matter of expression. When men think not so much of what they want to say as of how they are going to say it, what they write is fairly certain to lose something of the freshness which springs from unconsciousness. No one can be expected to speak with ease when before his mind looms constantly the prospect of possible criticism of the words and constructions he has employed. If grammar, or what he considers grammar, prevents him from resorting to usages to which he sees no objection, it has in one way been harmful if in another way it has been helpful. Correctness may have been secured, but spontaneity is gone. The rules laid down for the writer's guidance may be desirable, but they are likewise depressing. He thinks of himself as under the charge of a paternal government, and he is not happy; for our race, in its

linguistic as well as in its political activity, bears with impatience the sense of feeling itself governed.

Such a result would be sure to follow, were grammars and manuals of usage absolutely trustworthy. But no such statement can be made of most of them, if, indeed, of any. It is an unfortunate fact that since the middle of the eighteenth century, when works of this nature first began to be much in evidence and to exert distinct influence, far the larger proportion of them have been produced by men who had little acquaintance with the practice of the best writers and even less with the history and development of grammatical forms and constructions. Their lack of this knowledge led them frequently to put in its place assertions based not upon what usage really is, but upon what in their opinion it ought to be. They evolved or adopted artificial rules for the government of expression. By these they tested the correctness of whatever was written. They were thereby enabled to proclaim their own superiority to the great authors of our speech by pointing out the numerous violations of this assumed propriety into which these had been unhappily betrayed. As the rules they proclaimed were copied and repeated by others, a fictitious standard of usage was set up in numerous instances and is largely responsible for many of the current misconceptions which now prevail as to what is grammatical.

It is the belief in this fictitious standard which is responsible not merely for numerous misstatements about the correctness of particular phrases and constructions, but for the frequent failure to comprehend the nature of prevailing linguistic conditions. One of the latter requires special mention here. It is no in-

frequent remark that in these later days there exists a distinct tendency towards lawlessness in usage, a distinct indisposition to defer to authority. We are told that the language of the man in the street is held up as the all-sufficient standard. If this statement were ever true, it was never less true than now. There might have been apparent justification for an assertion of this sort in the great creative Elizabethan period. Then no restraints upon expression seem to have been recognized outside of the taste or knowledge of the writer. As a consequence, the loosest language of conversation was reproduced with fidelity in the speech of the drama, then the principal national literature. But nothing of this freedom is found now. A constant supervision over speech is exercised by amateur champions of propriety. These are ensconced at every fireside. In colleges and academies and high schools they constitute an army of assumed experts, who are regularly engaged in holding in check any attempt to indulge in real or supposed lawlessness.

It is not, therefore, from the quarter of license that any danger to our speech arises. If peril exist at all, it comes from the ignorant formalism and affected precision which wage perpetual war with the ancient idioms of our tongue, or array themselves in hostility to its natural development. That this, so far as it is effective, is a positive injury to the language was pointed out several years ago by a scholar who, in consequence of the study he had given to the usage of the great writers, was enabled to speak on this subject with an authority to which few have attained. He was discussing the remarks of certain critics who had professed to consider as inaccurate and ungrammatical

the preterite *wended* in the locution, "he wended his way." "It is by such lessons as these," he continued, "that the unreflecting and uninquiring are misled into eschewing, as if they were wrong, words and phrases which are perfectly right." If there is any revolt against the authority of such guides, equally blind and presumptuous, if there is any lack of deference to the rules they seek to impose, it is a condition of things to be welcomed and not to be deplored.

Obviously it is idle to discuss questions of usage unless some general principles can be established in accordance with which the correctness or incorrectness of particular expressions can be tested. If these do not exist, or if they cannot be ascertained, opinion as to the propriety of particular words or grammatical constructions will necessarily vary with the tastes or prejudices of the writer or speaker. If this be not supported by adequate knowledge, it will ordinarily be little more than the expression of personal feeling. A particular individual dislikes a particular word or phrase. That is one of the best of reasons why he should not employ it himself; it is not a very cogent reason for inducing others to follow his example. There are, of course, many offences against good usage that cultivated men everywhere will condemn without hesitation. These, however, are not the ones that cause embarrassment. Every writer is constantly confronted with the denunciation of words and locutions which he not only hears in the speech of those he meets daily, but finds employed in the works of men regarded by all as authorities. If he himself has made no study of the usage thus condemned, if he recognizes that he is not in a position to decide the matter for

himself—and few men have either the leisure or the opportunity to gain the special knowledge requisite for that purpose—it is inevitable that he should be left in a state of perplexity and consequent indecision.

Assertions as to what is proper or improper in speech are now, indeed, encountered everywhere. They naturally form a constituent part of grammars. They furnish the sole contents of some manuals. They turn up in most unexpected places in books and periodicals of every sort. It is a subject upon which every one feels himself competent to lay down the law. It has now become practically impossible for any writer so to express himself that he shall not run foul of the convictions of some person who has fixed upon the employment of a particular word or construction as his test of correctness of usage. Should any person seriously set out to observe every one of the various and varying utterances put forth for his guidance by all the members of this volunteer army of guardians of the speech, he would in process of time find himself without any language to use whatever. Just as, in the *Old Curiosity Shop,* Dick Swiveller's approaches to the Strand were cut off in succession by the creation of new creditors in different streets, so the writer's avenues to expression would be closed one by one, and he would finally be compelled to resort to the most tortuous and roundabout devices to convey the simplest meaning.

Can, therefore, any general principles be found which will put us in a position to reach in any given case conclusions independent of our personal prejudices or prepossessions? One there certainly is which, until lately at least, has been always accepted

without question. In the form in which it is familiar to us it was stated about two thousand years ago by Horace in his treatise on the Poetic Art. There he tells us that words which are now disused shall be revived; and words which are now held in honor shall disappear. Then he adds the remark which has become almost a commonplace:

> "Si volet usus,
> Quem penes arbitrium est et jus et norma loquendi."

Usage, therefore, according to the dictum of Horace, is the deciding authority, the binding law, the rightful rule of speech.

But a further question at once arises. Usage, it may be conceded, is the standard of speech. But whose usage? Certainly not the usage of this man or that man indifferently. Horace, in laying down his dictum, could not have been thinking of the general body of his fellow-countrymen. These spoke the Latin of the camps and the market-place. Much of what they said would have sounded to his ears as barbarous; some of it would in all probability have been absolutely unintelligible. But if he did not mean these, of whom was he speaking? The answer is so evident that hardly anything can be more surprising than the doubt which has been entertained and expressed of its exact nature. Clearly, what Horace had in mind was the usage of the best speakers and writers. It was that, and that only, which in his eyes constituted the standard of propriety. The acceptance by such men of a new word or locution, no matter from what source coming, gave it established currency; their employment of a grammatical form gave it the stamp of authority. The

usus of Horace was, in consequence, precisely the same as that which Quintilian called later the *consensus eruditorum* — the agreement of the cultivated. Good usage, in short, is the usage of the intellectually good. The same thought is brought out strongly by Ben Jonson in his observations upon style, though his words are little more than a literal translation from the Latin author last named. "Custom," said he, "is the most certain mistress of language, as the public stamp makes the current money." But, like Quintilian, he was careful to define what he meant by this supreme authority. "When I name custom," he added, "I understand not the vulgar custom; for that were a precept no less dangerous to language than life, if we should speak or live after the manners of the vulgar; but that I call custom of speech, which is the consent of the learned; as custom of life, which is the consent of the good." [1]

The dictum of Horace, indeed, has hardly been called in question for most of the two thousand years which have elapsed since its utterance. But of late attempts have occasionally been made to dispute its correctness. Many of these have come from those who evidently did not comprehend what the poet meant by *usus*. They have, consequently, imputed to Horace something which Horace never had in mind. They have attributed to him the promulgation of the error just indicated — that is, that anything is good usage which is sanctioned by the usage of the large majority of speakers and writers, independent of the character of the individuals who make up that majority. But denials there have been of his assertion by certain per-

1 Ben Jonson, *Discoveries, De orationis dignitate.*

sons to whom it is hardly possible to attribute this lack of perception. These have been put forth in books which in some cases still continue to have a fairly respectable sale. The remarks made by the writers of these works show, however, that it is much easier, as it is altogether more common, to content one's self with a general denial of the truth of the poet's declaration than to find any substitute to take its place. Authority there surely must be somewhere. Did it not exist, there would be a reign of license in which each man, no matter how incompetent, would be a law unto himself. If usage, therefore, is not the standard of speech, it is reasonable to ask, What is? If the best speakers and writers are not guides, to what quarter can we repair in cases of doubt or difficulty?

Several answers or rather attempted answers have been made to this question. Let us take up the consideration of the two most loudly trumpeted substitutes which are to furnish us a higher law for propriety of speech than can be found in good usage. The first of these, we are told, consists in the principles of universal grammar. In them is lodged the supreme authority. What are these principles of universal grammar, it is natural to ask. They can hardly be anything else than rules based upon practices which all languages agree in observing. But if there be such, we come back for their establishment to the usage of those who speak these various tongues. Consequently, whenever in them usage differs, as in many instances it does, we must either deny in a given case the general applicability of the particular principle, or insist upon deciding the grammatical propriety of the practice of one tongue or of one set of tongues by the practice

of an alien or of alien tongues. To put this matter in as clear a light as possible, let us consider an illustration furnished by one of the most ardent upholders of universal grammar as the final arbiter. "No amount of wisdom," says he, "can excuse the use of a really singular noun with a plural verb, or the reverse."

This has certainly a reasonable look. If any example can be adduced which will justify the establishment of this theoretical standard of propriety, none is likely to be found more satisfactory than the one just given. But at once there arises the thought that in the Greek language — by many deemed the most perfect instrument of expression that mankind has ever known — the plural nominative of the neuter noun had pretty generally its verb in the singular. How does the advocate of the law higher than usage meet this violation of his principles of universal grammar? He does not meet it; he calmly evades it. He assures us that the Greek neuter plural may be looked upon as a collective. But if this be so, it must be because usage has come to deem it as such; for it cannot be so in the nature of things. Furthermore, if the privilege of thus regarding it be conceded to the Greek, it must also be conceded to the English or to any other tongue, if its users prefer to look upon it in such a light. The imputed authority of universal grammar consequently breaks down in its chosen illustration. Nor are we here at the end of our difficulties in the very example under discussion. In modern Greek the construction in question no longer exists. Even in ancient Greek it occurs much less frequently in the Epic dialect than in the Attic. What, then, are we to think of these vaunted principles of universal grammar

which allow a construction to be proper at one period or in one speech, and at another period or in another speech declare it to be improper? As a matter of fact, it will be found that in every instance selected to illustrate the impossibility of usage overriding grammar, it is usage that has to be evoked in order to justify the apparent violation of grammar which has taken place.

Still another standard has been set up which has the distinction of being much more confidently proclaimed than clearly defined. Here are the words of one of its promulgators. "The truth is," says Richard Grant White, "that the authority of general usage, or even of the usage of great writers, is not absolute in language. There is a misuse of words which can be justified by no authority, however great, by no usage, however general." [1] There is nothing at all new about this assertion. It is the one which has been regularly made for the last hundred and fifty years by every person who finds that locutions to which he takes exception occur in the writings of those whose literary superiority is everywhere recognized. Like his predecessors the utterer of this dictum did not make any definite announcement of the standard which was to take its place. As near, however, as can be gathered from various passages in his writings, the guide he had in mind was reason. Under its benign direction, we are told that "rude, clumsy, and insufficiently worked-out forms of speech, sometimes mistakenly honored under the name of idioms," tend more and more to disappear.[2]

Unfortunately for the guide here designated, reason

1 *Words and Their Uses*, p. 24.
2 *Ibid.*, p. 23.

in the intellectual world is very much like conscience in the moral; the same fact will lead two men to draw exactly opposite conclusions. The dictates of each ought, of course, to be obeyed by the individual; it is quite another thing to seek to impose them upon the conduct of others. In morals an unenlightened conscience often induces its owner to condemn the acts of those far better than himself. Worse than that, it sometimes leads him to commit acts in themselves essentially wicked. It is exactly the same in the matter of language. An unenlightened reason constantly leads men to condemn words and constructions used by those far superior to them in knowledge and taste and ability. But even where ignorance does not prevail, any so-called standard, such as reason, fails us when it is most needed. Two persons, each of a high degree of intelligence, are often found disagreeing as to the propriety of employing particular words or constructions. Their knowledge may be the same; it is their judgments which vary. In the conflict between the reasoning powers of two equally cultivated men who is to decide? The only way that can properly be taken — it may be added, it is the only way that ever is taken — to settle the dispute is by an appeal to authority. That, of course, is nothing more than the reason of the best speakers and writers exhibited in their practice. Here once again we come back to usage, as the standard of speech. It invariably turns up as the final court of appeal. Whatever road we set out to take, we find ourselves travelling in this one at last.

The truth is, were everything known about good usage with the positiveness with which assertions about

it are made, the constant controversies which arise in regard to it would be a simple impossibility. In discussions of it, what is called reason is often only another name for ignorance. The "insufficiently worked-out forms of speech, sometimes mistakenly honored under the name of idioms," prove to be insufficiently understood forms of speech which the verbal critic condemns because he knows nothing of their nature and history. In consequence there has never really been the slightest ground for disputing the dictum of Horace when rightly understood. It embodies nothing more than the result of universal experience. There are modifications, or, rather, explanations, to which it is subject; but its general truth cannot be successfully questioned. The standard of speech is therefore the usage of the cultivated. Such men are the absolute dictators of language. They are the lawgivers whose edicts it is the duty of the grammarian to record. What they agree upon is correct; what they shun it is expedient to shun, even if not wrong in itself to employ. Words coined by those outside of the class to which these men belong do not pass into the language as a constituent part of it until sanctioned by their approbation and use. Their authority, both as regards the reception or rejection of locutions of any sort, is final. It hardly needs to be said that "the man in the street" is not only no dictator of usage, but that he has no direct influence upon the preservation of the life of any word or phrase. This depends entirely upon its adoption by great writers. If these fail to accept a new locution, it is certain to die eventually and as a general rule very speedily. On the other hand, the purist is as little a

final authority. He may protest against the employment by famous authors of certain words or constructions. He may declare these opposed to reason, contrary to the analogies of the language, or tending to destroy distinctions which should be maintained. If they heed his remonstrances, well and good. If they disregard them, he mistakes his position when he pretends to sit in judgment upon the decisions of his masters.

The establishment of this dictum, with the limitation of its meaning, leads directly to another conclusion. Good usage is not something to be evolved from one's own consciousness, or to be deduced by some process of reasoning; it is something to be ascertained. It must be learned just as language itself is learned. Furthermore, there is no short-cut to its acquisition. Grammars may in some instances help us; in some instances they do help us, but in others they sometimes do just the reverse. But in no case can they ever be appealed to as final authorities. There is one way and but one way of attaining to the end desired as a theoretical accomplishment, and fortunately it is a course open to every one. Knowledge of good usage can be acquired only by associating in life with the best speakers or in literature with the best writers. The latter resource is always available. It is the practice and consent of the great authors that determine correctness of speech. The pages of these are accessible to all. If they differ among themselves about details, choice is allowable until a general agreement settles in course of time upon one mode of expression as preferable to another or to any others proposed.

So much for the general principle. But there is a still further limitation of the sense of Horace's dictum. When we say that usage is the standard of speech, we mean not merely good usage, but present good usage. Neither the grammar nor the vocabulary of one age is precisely the grammar or vocabulary of another. The language of a later period may not vary much from the language of an earlier one, but it will vary somewhat. It is not necessarily better or worse; it is simply different. The fact that the good usage of one generation may be distinctly improper usage in a generation which follows is frequently exemplified in the meanings given to individual words, and sometimes in the words themselves. This we all accept as a matter of course. But the same statement can be made just as truly of grammatical forms and constructions. In the case of these the variations between different periods do not impress themselves so much upon our attention because they are comparatively few. Still they occur. Ignorance of this fact or indifference to it has often led to the denunciation of the writers of the past as being guilty of solecisms or barbarisms, when they have done nothing more than conform to the usage of their own time. If such criticism be accepted as just, we in turn shall be left at the mercy of our descendants. We shall be reproached for employing words in senses they do not approve, or for resorting to forms and constructions which they have ceased to look upon as correct. If we recognize that whatever is in usage is right, we must be prepared to go a step further and concede that whatever was was right.

VII

The New Epoch

By George S. Morison [1]

STUDENTS of primitive society have divided the early development of the human race into ethnical epochs, representing various conditions of savagery and barbarism, and finally culminating in civilization; they recognize three periods of savagery, followed by three periods of barbarism. In the lowest epoch men were

1 This essay and the two following are taken from G. S. Morison's book, *The New Epoch as Developed by the Manufacture of Power*, published by Houghton Mifflin in 1903, in which they form Chapters I, V, and VI, respectively. They are printed here with the generous permission of Mr. Robert S. Morison, the owner of the copyright. *The New Epoch* is a widely read and widely quoted discussion of the profession of engineering in its relations to present-day problems of business, government, and education. Every thoughtful student of engineering should read it entire. The title of this chapter in Mr. Morison's volume is "General Conditions." That has been changed here to "The New Epoch" (a title which Mr. Morison used twice for this material when presented in lecture form) as being more accurately descriptive of the contents when printed as a separate essay.

George S. Morison, 1842–1903, was educated at Harvard; he was admitted to the bar in New York in 1866 and engaged for one year in the practice of law. He then deserted law for engineering and became one of the leaders of the profession. He was chief engineer of the bridge across the Ohio at Cairo, Illinois, and for the one across the Mississippi at Memphis, Tennessee; he built during his life four other bridges across the Mississippi and ten across the Missouri river. He served on various important engineering boards, was a member of the Isthmian Canal Commission 1899–1901, was President of the American Society of Civil Engineers in 1895, and was a Fellow of the American Academy of Arts and Sciences. In addition to *The New Epoch*, he was the author of many books and papers on engineering subjects.— EDITOR.

little superior to the animals by which they were surrounded. With the use of fire the second period began. With the invention of the bow and arrow, the most primitive form of projectile, man entered the third period. With pottery, and all that it implies, he passed from savagery to barbarism. The next advance came with the domestication of animals, which gave man another power besides his own physical strength. With the manufacture of iron the last of the barbarous periods was entered. By the invention of the written alphabet the primitive race was promoted from barbarism to civilization.

The use of fire first placed man in a condition very different from that of other animals, giving him a power the uses of which are even yet not fully developed. The domestication of animals was hardly less important, and although where animals suitable for domestication did not exist tribes were able to pass this period without them, their weakness was apparent when they came in contact with other races whose conditions were not so limited. Finally the invention of a written language made the work of one generation available for its successors and produced historical civilization.

The changes which mark the advances from period to period are all material improvements; in every instance they are characterized by some distinctive physical device which has enabled man either to utilize his own strength better than before, or to increase his power by adding other animate or inanimate force. The race that passed from one period to another acquired resources which it had not before; in the contests which characterized the life of the primitive

man, the men of a lower period fell before those who had risen higher. But though the devices were of a purely material character, they gave opportunities for mental and moral improvement which alone made further advance possible, till finally the written alphabet resulted in that preservation of knowledge which has made the intellectual efforts of thirty centuries available for ourselves. With the dawn of civilization the ethnical periods have been considered closed; subsequent growth has been the natural advance of civilization marked by the events which make written history.

But there is no reason why the epoch which began with writing should be the last. It only needed a new capacity, radically unlike those which have gone before, to make an epoch in civilization as distinct as those in primitive society. Such new capacity has now been found; another epoch has begun. Fire, animal strength, and written language have in turn advanced men and nations; something like a new capacity was developed with the discovery of explosives and again in the invention of printing; but the capacity of man has always been limited to his own individual strength and that of the men and animals which he could control. His capacity is no longer so limited; man has now learned *to manufacture power,* and with the manufacture of power a new epoch began. These words are used advisedly; creation, whether of substance or force, is not given to man; manufacture is not creation, but to change inert matter from one form to another in such way as to generate power is to manufacture power, and this we can do.

Furthermore, not only does the manufacture of power mark a new epoch in development, but the

change is greater than any which preceded it; greater in its influence on the world; greater in the results which are to come.

The manufacture of power means that *wherever needed* we can now produce practically unlimited power; whatever the measure of a single machine, that machine can be used to make a greater one; we are no longer limited by animal units, confined by locations of waterfalls, nor angered by the uncertain power of wind. Power can be had where it is needed and when it is needed. The power generated in a modern steamship in a single voyage across the Atlantic is more than enough to raise from the Nile and set in place every stone of the great Egyptian pyramid.

The new epoch differs from all preceding epochs, in that while they represented successive periods of progress, different races have existed simultaneously in every period of advancement, whereas the new epoch must from its very nature soon become universal. The manufacture of power has given us the means of traversing the entire globe with a regularity and speed which brings all races together, and which must in time remove all differences in capacity. It brings people of all races into contact, and, by extending knowledge, ends the superstitions and mysteries which have had such influence in the past. It enables man while working in unhealthy districts to spend a portion of his time in places favorable to physical health and bodily vigor, and so may end the climatic degeneration of race, which has done so much in history. It is gradually breaking down national divisions, substituting the natural boundaries of convenient government for boundaries based on race and ignorance.

It will finally make the human race a single great whole, working intelligently in ways and for ends which we cannot yet understand.

It is not too much to predict that when the full effects of the manufacture of power are realized and the world has passed through the development which the next ten centuries will see, that the time when man began to manufacture power will be recognized as the division between the ancient and the modern, between ignorance and intelligence, between the national strife which may then be classed as barbarism and the new civilization, whatever that may then be called.

The new epoch has barely begun. No exact dates can be fixed. Epoch making is not a matter of a single invention; it is the general result which follows. It was not the manufacture of the first earthen pot, but the general introduction of pottery which carried a prehistoric race from savagery to barbarism. It was not the invention of a few letters, but the general use of a written language which took the barbarian into civilization. It was not the invention of the first steam engine, but the general control of the manufacture of power which is now taking mankind into the new civilization. James Watt developed his first steam engine in 1769. The steam engine began to come into general use about the beginning of this century. The nineteenth century has seen the development of the manufacture of power by steam. The steam engine is still almost the sole representative of manufactured power, but there is no reason why this should continue. Electricity as a conveyor of power has been developed to an extent which may almost be classed with manufactured power. New forms of manufactured power

may come at any time, but the introduction of new forms is a comparatively unimportant thing. The great advance came with the ability to manufacture power at all; the method is a secondary thing.

It is easy to understand that when the new epoch is fully developed all physical work may be dependent on inanimate power. It is easy to see that this means the concentration of enormous masses of power where power never could be had before; that it means the subdivision of power into units of a minuteness hard to conceive; that it means the unraveling of mysteries which have never been solved; that it means the construction of works of a magnitude before which the greatest monuments of antiquity become insignificant. The fighting ship of to-day is a floating machine-shop, though its crew of mechanics are confined as completely as the chained rowers of a Roman galley. The battles of the future will not be fought by men or by horses; the camels of the desert will never again confront the elephants of the jungle; fortifications will be factories filled with power. It is easy to recognize that the discoveries already made may be slight in comparison with those which are to come. All this is a matter of physical possibility; it is interesting to speculate upon; it is foolish to prophesy about; these achievements are too close at hand for us to waste time in guessing what they will be.

The substitution of inanimate manufactured power for the animal power on which our race was formerly dependent means a separation of the force which does the work from the intellect which directs it. The power which we make and use is absolutely without sense; all this must come from the human mind.

The man who drives a horse has little to do; the horse finds the way and does the work. But the driver of a motor carriage has a senseless machine, and all direction must come from him. Manufactured power demands intelligence to supply the sense which the power lacks. The extreme logical development would be a condition where every kind of physical work is performed by machines, while human effort is reduced to design and care. Such a result will never be reached. So long as men have bodies, the forces placed in those bodies must be used, but the substitution of manufactured power for human labor is a promotion for man, whose value becomes measured by skill in directing power and not by muscular strength.

No changes have ever equaled those through which the world is passing now. The manufacture of power has an intellectual as well as a physical effect; it has separated power from the mind which must manage it; it calls for intelligent design and direction of the multitude of works which it has rendered possible; it has equipped our generation with tools for study and investigation as well as for mechanical work. The new epoch will alter the relations between the professions, business, and trades; it will readjust the duties of government and the relations of one government to another; it will change our system of education. These changes will be considered in relation to business, to national interests, and to education. The larger subject of government and international relations can only be touched upon briefly, but the effect of the new epoch is very important, and its influence in shaping the duties of government must not be overlooked. The group of new professions which are now

coming into life will be reviewed and their proper influence on work outside of professional lines explored. The general demands of education in the new epoch will be considered, and some suggestions will be made as to the best methods of meeting these demands.

VIII

The Profession of Engineering

By George S. Morison [1]

The new epoch has opened an entirely new set of professions. The old professions were primarily divided into two classes, the military and the civil, and of the latter only three were recognized, — divinity, law, and medicine. These three were called liberal professions, and their members were supposed to be, and generally were, better educated, though not always more thoroughly trained, than the men who followed other callings. The demands of the new epoch are such that educated men are required everywhere. They are needed to design the tools by which power is manufactured and is utilized; they are needed to manage the affairs of the corporations whose capital is invested in

1 The title of this chapter in Mr. Morison's book is "Civil Engineering" and throughout the chapter Mr. Morison speaks of engineering in general as Civil Engineering, taking his title from the old distinction between Civil engineers on the one hand and Military on the other, a distinction which puts all engineers whose work is not strictly military — civil, mechanical, electrical, chemical, mining, and sanitary — under the one head of Civil Engineers. Whatever historical warrant this nomenclature may have it is not the usage of the profession today, and I have taken the liberty — on the advice of several professors of civil engineering — of silently deleting the word "civil" from the text wherever Mr. Morison, in speaking of "civil engineering," evidently means engineering in general. This is done, it need hardly be said, not with the object of warping Mr. Morison's meaning, but rather of making his meaning clearer to engineering students.— Editor.

the great variety of tools, and which have been referred to; they are needed to perform the increased duties which governments are now assuming.

Seventy years ago engineering was defined as the art of directing the great sources of power in nature for the use and convenience of man.[1] This definition was embodied in the charter of the institution which has done more than any other to unite the profession and to give it the standing it is now attaining. It was made in the very infancy of the new epoch, within sixty years of the time when Watt developed his first steam engine. . . . The definition was followed by a list of objects and applications, but it was expressly stated that its real extent was limited only by the progress of science, and that its scope and utility would be increased with every discovery, and its resources with every invention, since its bounds were unlimited, as must also be the researches of its professors. This definition is broad enough to embrace every department of work which undertakes the development and use of any of those physical powers through which the new epoch is now subjecting all varieties of matter to the dominion of mind.

The constitution of the American Society of Civil Engineers fixes as a requirement for full membership "the ability to design as well as direct engineering works." The English definition and the American requirement taken together explain what constitutes an engineer. His business is to design the works by which the great sources of power in nature are directed. His works are not built for themselves nor as

1 Thomas Tredgold, 1828; subsequently embodied in charter of the Institution of Civil Engineers.

commemorative monuments; they are made to direct the powers of nature for the use of man. Every engineering work is built for a special ulterior end; it is a tool to accomplish some specific purpose. Engine is but another name for tool. The business of an engineer relates to tools. An engineer must be capable of designing as well as handling tools. The highest development of a tool is an engine which manufactures power. All the great possibilities of this profession come from the existence of such tools.

. . . . . .

The engineer of the new epoch, the epoch which he is bringing into existence by the manufacture of power, must be an educated man. In no profession will this be more necessary. The physical laws of power and strength are mathematically exact and admit of no trifling. As the epoch progresses the requirements for each individual will become more complicated. The theologian and the metaphysician may claim that an education based on the laws of matter leaves out the highest part of existence; the biologist and the physician may claim that matter endowed with life is a higher organism than the inanimate matter with which the engineer has to deal. But however true these claims, their laws have not the mathematical rigidity, the clear definition, and the thorough discipline which mark the laws with which our profession works. The engineer cannot shield himself under doctrines or theories which he accepts but cannot understand. Dealing with accurate, definite laws and guided by the corrective touch of physical nature, the education of the engineer will become more necessary, more thorough, and more exact than that of any other profes-

sional man. This is the training which the engineer of the new epoch must have. This knowledge he must have, or he must be classed as a workman rather than a professional man.

The engineer of the new epoch must sink the individual in the profession. The engineering work of the future must be better work than has ever yet been done. The best work is never done by separate men. It is only accomplished when professional knowledge so permeates all members of a profession that the work of one is virtually the work of all. The first steps are made by individuals, but the best results come later. In the Middle Ages Gothic cathedrals were built throughout northern Europe. They are exquisite works; no modern architect can approach their beauty. The reason is that the men who built the Gothic cathedrals worked together as members of a guild which was thoroughly imbued with the spirit of building these churches. In no period of the world's history has marine construction had any significance compared with what it has to-day, and it is because the great shipbuilders are working together, each having the practical benefit of what they all are doing. They are working together as members of a profession rather than as individuals, and their work is becoming more uniform and more perfect.

The engineer of the new epoch must be a specialist. No man can learn to design all the tools by which the powers in nature are to be directed. The work is too great for one man to master. The best results will only be obtained by concentrating effort in a single line. But though the engineer must be a specialist, his specialty must not be of a narrow kind; he must

have that general knowledge and training which make the liberally educated man. In every occupation a natural selection of men takes place; some follow the close lines of the work for which they are trained, while to others this training is but an incident in the early part of their careers, and does little more than point the general direction of their lives. The ability to deal with men and to direct the minds of men is a matter of natural gift more than of education. It is so important that when possessed in a high degree, all other accomplishments yield to it; and its possessor, realizing that the ability to use several minds gives him the same advantage among his fellows that the control of additional power has given among races, will use his capacity. But the positive training of an education has its value for men whose paths of life may lie far from the special work for which they were trained; it will at least teach them the importance of accurate knowledge. Too many men are contented to guess rather than to know, relying on personal tact to relieve themselves from difficulties when their guesses are wrong.

The engineer of the new epoch must fill many positions which are now held by men of different training. The knowledge of the tools, both large and small, which men are using, must be the strongest qualification for their use. Accurate engineering knowledge must succeed commercial guesses. Corporations, both public and private, must be handled as if they were machines, and the men who will so handle them will find their best training in the education which will make the best engineers. These managers may not be called engineers, but engineering should not find fault with

titles; the man whose training has fitted him to do the work of an engineer will not cease to be one if he is promoted to a high position of management.

When ability to rule meant ability to defend against invasion, to maintain war against foreign enemies, government was in the hands of soldiers. As society became more complicated, and a permanent administration of civil matters more necessary, domestic affairs being more important than foreign, the administration passed largely into the hands of lawyers. The legal profession was long the only educated profession whose members were available for public work. The functions of government are changing. The demands of the new epoch are not like those of the past. Safety from foreign invasion is needed less than safety from dangers which lurk within,— from the poisons, both moral and physical, which endanger concentrated population; from bad air, bad water, and bad construction; from corrupt administration, and from bacteria. The rulers and governors, who at first were soldiers, who subsequently were selected from men trained as lawyers, must in the future be taken, at least in part, from those who are educated in the utilization of the powers in nature,— from engineers and the men who are equipped with the new education for the benefit of their country. The duties of municipal government, or the government which is most closely concerned with local affairs, must become very much like the management of corporations. In fact, a municipality is a public corporation rather than a government, and its duties should be performed in the same way as those of a corporation. The same class of men will do the best work for a city that will make the best

managers of manufacturing corporations. In cities and in many communities the duties of the government rest more on good engineering than on legal skill. The whole life of the community depends on appliances and conveniences which the manufacture of power alone has made possible. For all this work the government needs neither soldiers nor lawyers, but men educated in the various departments which come within the broad definition of the work of the engineer.

The tools which engineers have to build are generally large. The physical man is often a tiny thing beside the work which he has to construct. Nothing better illustrates the power of mind over matter than the work of this profession. Though it deals with matter and its work is of a material kind, it is the mind which has made this matter give forth power; it is the mind which is opening the new epoch, and it is by the training of this mind that the engineer must prevail. He is the priest of material development, of the work which enables other men to enjoy the fruits of the great sources of power in nature, and of the power of mind over matter. He is the priest of the new epoch, a priest without superstitions. But if this profession is to do the good work of which it is capable, the true spirit of individual immolation which has characterized the devoted priest of all ages must be found among its members. The profession can only do its future work by trained minds working together.

IX

Engineering Education

By George S. Morison [1]

GREAT as is the effect which the developments of the new epoch are having on the engineering profession, their influence on education is equally important. The duties of universities are being entirely changed. Great changes impose new duties on the institutions which are charged with the intellectual development of the community. No changes have ever equaled those through which the world is passing now. No institution has greater responsibilities at this time of change than those which rest on a university. The manufacture of power has an intellectual as well as a physical effect; it has separated power from the mind which must manage it; it calls for intelligent design and direction of the multitude of works which it has rendered possible; it has equipped our generation with tools for study and investigation as well as for mechanical work.

A university is more than a school; it is not merely a college; still less should it be an eleemosynary institution for the benefit of young men to whom it can give

1 This is the sixth chapter of Mr. Morison's book (see Note to Essay VII) and is there called "The University." The excuse for changing the title for the purposes of this collection is as before to make the heading a more accurate description of the contents of the essay.

an education. A university owes its duty to the community as a whole, not to individuals who live in that community. The endowment which a university may receive, whether it come from public appropriation or from private gift, must come to it as to a public benefactor, endowed and sustained in order that the whole community may have the benefit of its intellectual guidance. It must not train young men because those young men wish to be scholars, but because trained scholars are necessary for the good of the community. The individual must be sunk in the nation or state of which he is a part; the young men whom the university educates should know that they are educated to be useful members of a community, and not for their own ends. The real duties of a university are universal; it is the head of the educational system of the land, charged with the high responsibilities which this position implies; it must be the depository of the lore which former generations have accumulated and the pilot of the community in every kind of intellectual life; it must preserve the records of the past, and it must train the men who are to make the records of the future; it must combine the work of a museum with that of a school.

A collection of physical objects, though those objects be most rare and curious, does not make a museum. A collection classified and arranged in the most systematic manner that has ever been devised would still be incomplete. It must be a collection of the records of the past, including that which can be stored only in the mind. A classified museum, though it include a library containing every book that has ever been written, would be of no value without the minds to

use it. The museum which forms so important a part of a university must include among its collections a collection of educated men.

The school which is to train the men who are to make the records of the future must build its special courses on the foundation of an education which teaches how to use the mind. This is the real measure of a liberal education; without this, the men it educates will be of little value in the community.

The new epoch which the manufacture of power is bringing forth makes new demands upon a university — new demands upon it as a museum in the large sense which has been stated; new demands upon it as a school to train the young men whom the community needs, and who will make the records of the new epoch.

The new epoch has an inheritance from older times. It increases the work of a university in its capacity of museum. In the mere collection and preservation of records, the work is greater in a period of change than at any other time. Generally, in passing from one ethnical period to another, the records of the past have been lost. The students of the earliest life of man have to grope among prehistoric remains, deciphering marks which seem almost as inanimate as geological strata, and tracing their uncertain way by analogies drawn from races living to-day.

The new epoch must destroy as well as build; the new civilization will wipe out the conditions which precede it. The savage and barbarous tribes which now live simultaneously in different parts of the world must disappear. If their habits, customs, and mental conditions are to be recorded, the work must be done

soon; in one or two centuries it will be too late. The structures which represent the achievements of many generations cannot be preserved. A few may be kept as beautiful relics, specimens in a universal museum. But the manufacture of power has made the demands of the new epoch so different from those of the old that nearly everything which has to be used must be built anew. The old and the new cannot exist together. It is hard to realize how rapidly the appearance of the whole earth may change. Greater care of life is a feature of the new epoch. An increase of population at the rate of one per cent annually, which is less than that in European Russia, would cover the entire land surface of the globe, including deserts, mountains, and snow-capped plains, with a population as dense as that of Belgium, in about three centuries. In the change through which we are now passing, a change which will leave no isolated tribes for the future, it is one of the duties of the university to see that the museums of the future are stored with the full history of the past.

The new epoch is characterized by great material changes. In such a time there is danger that natural science and physical study will overpower all other thought. The treasures of philosophy, of music in the broad Greek meaning, and of religion in the noblest sense, must be a special charge of the university.

Around the museum, of which they will form a part, must be gathered the men who will collect, study and care for what it contains. The university must train and educate these men to be the curators and scholars who will see that record precedes destruction; who will take care that, when physical existence ends, the facts which scholars need are preserved,— and

who will themselves be the scholars who are to use these records. The education of these men must include the intelligent study of the delicate accomplishments and refinements of the past; the new epoch may not have the grace and taste which have marked some inferior conditions; in the creation of beauty, Europe and America are to-day far below the nations which dwelt around the Mediterranean two thousand years ago, or the older races which still inhabit Asia. The study of history belongs to this department. The training for those professions which are based on history and precedent will find a place here. But few of the young men so educated will remain to form the body of educated men which is an essential part of the university museum; the majority will seek other lives and callings. The general body of educated men, as education was once understood, the men who are students rather than workers, readers rather than originators, who are guided by what others have done rather than by what they themselves would do, will be educated in this museum.

This work is much like what the university has always been doing. In this department the effect of the new epoch is to develop rather than to change; it makes the old work greater and more important than before; greater because there will be more workers, more to do, and more tools to work with; more important because much which cannot be done soon may be lost forever, and because the life of a community busied with material development needs a double leaven from the educated past.

But the community has needs for the future as well as for the past. The records of the past must be

preserved and studied by that body of educated men who make the society of a university town the most refined and intelligent that is anywhere found, and who give to the precincts of a university a peculiar attraction which exists in no other place. The records of the future must be made by men of different types and different habits, who are educated to fit them for active work, who will exchange the pleasures and quiet of the university for the roar of the rolling-mill, the buzz of the machine-shop, the obscurity of the mine, the bustle of the railroad, and the harsh surroundings of many other duties. These men must be prepared to sacrifice the pleasures of education as such, and the delights of study for mental development, and spend their lives where their work calls them.

The definition of engineering which is incorporated in the charter of the Institution of Civil Engineers has already been quoted, "the art of directing the great sources of power in Nature for the use and convenience of man." The same definition may be accepted as measuring the duties of the new education which is to train young men for active work in the new epoch; this education must qualify them to handle all the great sources of power in nature, whether those sources be animate or inanimate, whether the direction be mechanical or physiological, whether the work be investigation, construction, management, or invention; it must be prepared to deal with every kind of matter of which the world is composed, with the power associated with such matter, and with the laws, simple and complicated, which govern it; the object must be to direct such matter and power for the improvement of mankind; this must be the work of the new education.

The engineer claims that all this work belongs to his profession, which should include every educated man who, with a clear knowledge of the laws which govern his work, is handling the powers of nature, be that work in a harbor, a machine-shop, a railroad, a mine, an edifice, or a laboratory; the fundamental condition being that the work shall be that of an educated man, who knows how to design and to direct, in accordance with nature's laws of construction, strength, and power.

There is one profession whose age and history have given it a rank by itself. Medicine had an old and honored name when engineering was still unrecognized. But it belongs with the new profession rather than with the older ones; its work deals with the powers in nature for the use of man. It differs from engineering in that it deals with organic life, and not with inanimate power. Its recent developments have been rendered possible by the same conditions which have developed engineering. Its place in a university is with the other branches of physical science in the new education, rather than in the historical museum.

The time is not far behind us when none of the occupations which strove to direct and use the sources of power in inanimate nature required any high degree of education. Practice and experience seemed to be enough. Good sense, guided by precedents, accomplished what was necessary. While in some ways a man specially educated had an advantage, it was not enough to give his work the marked position which belongs to an educated profession. This is no longer so. Within the last half-century the whole conditions have changed.

It is not the educated character of the man, but the educational needs of the work which makes an educated profession. The work must be such that it can only be done by those whose education has specially qualified them for it. Natural ability combined with education will always be greater than either of the two alone; but no occupation can become an educated profession until education gives the men who follow it a distinct advantage over those who have not received such education; and no profession will ever be composed entirely of educated men until the advantages of education outweigh those of mere natural ability.

The manufacture and use of power, though in its crude beginning easily understood and handled, has already reached a point where accurate knowledge and thorough training are needed for the best results. There is not a single department in the manufacture or use of power in which the advantage of a thorough education is not felt.

The study of the strength of materials, and the mathematical laws involved, is required in all structural work. The older structures were the gradual development of experience, each builder inheriting the work of his predecessors. So long as dimensions were small and the material generally excessive, this worked well, but modern engineering asks for the least material which can be used to produce safe results; the strains in every part of the structure must be calculated, and unnecessary material removed; the rule that nothing is stronger than its weakest part must be applied by eliminating the material which gives useless strength.

Metallurgy has become in all its details a matter of refined investigation. A minute variation in the

amount of phosphorus it contains will make the difference between a bar of steel which is perfectly safe for structural purposes and one which is treacherous and may break without warning. A large portion of the steel product of the world is now made in furnaces with basic linings which absorb the excess of phosphorus, and which were introduced, not by a practical iron-master, but by a chemist, who made dephosphorization his special study, and sacrificed his life to the ardor of his researches.[1]

The ordinary high-pressure slide-valve steam engine, such as is used for a sawmill in the woods, or for a straw-burning harvest outfit on a Dakota prairie, is a simple thing which anybody can understand, but its use is only justified because temporary convenience is more important than economy. The marine engine, where power is limited by capacity to carry fuel, is very different; scientific study and design have reduced the coal consumption of the best marine engines to less than a pound and a half per indicated horsepower; this has rendered possible the speed of the modern Atlantic liner and the extremely cheap carriage of the tramp freight steamer.

Electrical engineering, and the other professional branches which are multiplying rapidly, require a like scientific training.

This education is not a simple one. A smattering of knowledge may enable a man to understand what is going on, but to design and perfect the structures and machines which will give the best results requires a thorough knowledge of laws whose complications increase as their applications are extended. The

1 Sidney Gilchrist Thomas.

strength of materials, the chemical composition of substances, the laws of heat and of dynamic energy, with other equally important principles, enter into almost every operation of modern life. Every design must be worked out in accordance with the laws which govern it. There was a time when Yankee ingenuity was thought to be equal to anything, and the memory of that time still exerts its baneful influence; works which required educated engineers have been intrusted to ignorant men, and terrible disasters have followed this perversion of trust. The laws which govern the problems of mechanical and material devices are complete, and require trained minds for their solution; they are exact; they can be demonstrated absolutely, and a mistake may be followed at once by a disaster. There is no place among them for the strange theories which, when without the corrective influence of physical facts, seem to prove intellectual depravity; the man engaged either in the manufacture of power or the utilization of its sources in nature, can find no refuge behind unproved theories or questionable practices.

This work is the creation of an epoch differing from the past to such a degree that it may itself be considered new; the education which will fit men to perform this work must also differ from the old education. The old education teaches facts; it is based on a knowledge of what has been done. The new education cares little what has been done, provided no one ever wants to do it again. The men who are to adapt the great powers of nature to the use of man, who are to make the records of the future, must understand the laws by which they are to do this, must know how to investigate, and

how to work themselves, rather than know what work other people have done. No work is good unless made on correct principles, and education must equip the worker with these principles. The education of the engineer is intended to fit him to construct and use tools which serve some specific purpose; they must be adapted to their purpose and nothing else; he must be prepared to see them thrown away when their work is done. The machine must be properly proportioned; the heavy, clumsy tool which requires unnecessary power must be avoided as much as the weak tool which fails under its work. Furthermore, this education must be applied to every class of work; to all that great variety of tools by which the engineer utilizes the powers of nature; to those more permanent constructions by which the architect would build monuments for future ages.

As this education becomes more general, it will be realized that the basis of all true beauty is adaptation to its purpose; that the decorations of the so-called fine arts must be made subservient to correct and simple lines of construction, which they would emphasize rather than conceal. The false motto, *Ars celare artem,* which really means it is good to lie, must give place to the glorious *Veritas.* The incongruous absurdities of the present day must disappear. The engine frames of the first Cunard steamers were decorated with Gothic arches; beside the engines of a modern steamer these old machines have a strange fantastic look. Architecture, which as a fine art would consign itself to the museum, and sometimes, following the rapid changes of fashion, seems to differ from millinery chiefly in the want of a beautiful object on

which to place its novelties, will find its highest development in correct construction.

The engineering of the new epoch must be thoroughly good. This means the development of the true professional idea, and demands professional education. The best work has never been done by separate men; it is only accomplished when professional knowledge so permeates the whole body of workers that each member has the benefit of what all are doing. The first steps in invention and in new developments are taken by individuals; the best work is done later when the path into which the bold inventor ventured alone is trodden by the crowd who find it their usual course. The name of Watt was immortalized by his successful introduction of the steam engine, but there are thousands of men to-day who can build better engines than James Watt could. Marine construction owes its present high condition to the fact that ship-building has become a profession in which each builder has the real benefit of what all are doing. There lived in one of our great cities an engineer of marvelous inventive skill and world-wide reputation, who in a variety of ways has left his mark on the developments of the century; his history was a mixture of great accomplishments and strange disappointments; but the saddest part of the whole was the work of the last years of his long life, when, alone, having little intercourse with other men, he set himself the task of devising means by which future generations might manufacture their power when the supplies of fuel now in use should be exhausted.[1] Perhaps no engineer who has ever lived was as well qualified to solve this problem as he was;

1 John Ericsson.

but no man, however great, can do good work alone and before its time. When the problem on which he toiled for years becomes a real issue, there will be many men, of far less ability than he, who, sharing the professional experience which will come meanwhile, will have little difficulty in providing the needed power.

But the best professional spirit demands more than this. To training and instruction must be added the spirit which alone makes men worthy of the power education gives them. They must not only know how to work, but they must do it in the spirit which the best good of the community demands. The advance of mankind through the savage and barbarous periods was not continuous. Increased powers are susceptible of abuse as well as use, and the evil of the abuse has sometimes exceeded the good of the use. The new epoch will be no exception; its universality has only substituted other dangers for the barbarian invasions which destroyed older civilizations. The men who would sacrifice their friends and their country for their own selfish selves still live; the greater their capacities the greater the danger. Never before have the opportunities for selfishness been so great, whether that selfishness be devoted to acquisition of useless wealth, to indulgence in degrading luxuries, or to the general disregard of the rights of others, which may characterize poor and rich alike. In communities where everything is organized on the selfish basis of commercial life, these influences may transform the great forces of the new epoch into powers of destruction from which the world will never recover.

There is a capacity in the mind which can be

developed to meet these dangers. The antidote for these evils which selfishness begets is that power which, working in many ways and for many objects, takes a man out of himself and is called love, whether that love be for human beings, for animal life, for inanimate objects, or for laws and principles, which are at least as real as anything else. The education of the men who are to do the work of the new epoch must not only train them and teach them, but must fill them with that interest and enthusiasm which engenders love. This can be done; the more complicated the work and the higher the education, the more interest the worker finds to make him love his work. Every man who has entered earnestly into the study of the powers of nature, into the design of works which are to utilize those powers, or the execution of the plans which the world is profiting by, knows that this is true. The ordinary workman who works for wages only, does not feel this love; the professional man whose profession is simply a source of income, is little better; but education can be so directed that no man can really enter into the spirit of the work, for which this education has trained him, without caring more for the work than for the profit, without an interest which is really love. The men who are to save the new civilization from business trickery, commercial cruelty, and selfish indulgence must feel this interest in the work they do; they must seek the best results because they love the best; they must do their work because they love it, not perhaps with all their heart and soul, but with the full strength of their intellectual capacity. This love for their work has characterized the best students and investigators in

all ages. With the change which the manufacture of power has introduced, it should exist in every branch of work which deals with the utilization of the great sources of power in nature. The university will fail in its duty to the community if it does not inspire young men with a love for their work.

X

Two Kinds of Education for Engineers

By John Butler Johnson [1]

EDUCATION may be defined as a means of gradual emancipation from the thraldom of incompetence. Since incompetence leads of necessity to failure, and since competence alone leads to certain success, in any line of human endeavor, and since the natural or uneducated man is but incompetence personified, it is of supreme importance that this thraldom, or this enslaved condition in which we are all born, should be removed in some way. While unaided individual effort has worked, and will continue to work marvels, in rare instances in our so-called self-made men, these recognized exceptions acknowledge the rule that mankind in general must be aided in acquiring this complete mastery over the latent powers of head, heart, and

1 This essay is reprinted from Waddell and Harrington's *Addresses to Engineering Students* with the kind permission of the Editors. John Butler Johnson, 1850–1902, was a graduate of the Engineering Department of the University of Michigan in 1878 and became first a practising engineer and then a teacher of engineering. He was Professor of Civil Engineering at Washington University, St. Louis, from 1883 to 1899, and Dean of the College of Mechanics and Engineering of the University of Wisconsin from 1899 until his death in 1902. He was a member of several engineering societies, President of the Society for the Promotion of Engineering Education in 1898, and the author of many engineering papers and treatises.— EDITOR.

hand. These formal aids in this process of emancipation are found in the grades of schools and colleges with which the children of this country are now blessed beyond those of almost any other country or time. The boys or girls who fail to embrace these emancipating opportunities to the fullest extent practicable, are thereby consenting to degrees of incompetence and their corresponding and resulting failures in life, which they have had it in their power to prevent. This they will ultimately discover to their chagrin and even grief, when it is too late to regain the lost opportunities.

There are, however, two general classes of competency which I wish to discuss to-day, and which are generated in the schools. These are, *Competency to Serve,* and *Competency to Appreciate and Enjoy.*

By competency to serve is meant that ability to perform one's due proportion of the world's work which brings to society a common benefit, which makes of this world a continually better home for the race; and which tends to fit the race for that immortal life in which it puts its trust.

By competency to appreciate and enjoy is meant that ability to understand, to appropriate, and to assimilate those great personal achievements of the past and present in the fields of the true, the beautiful, and the good, which brings into our lives a kind of peace, and joy, and gratitude which can be found in no other way.

It is true that all kinds of elementary education contribute alike to both of these ends, but in the so-called higher education it is too common to choose between them rather than to include them both. Since it is only service which the world is willing to pay for, it

is only those competent and willing to serve a public or private utility who are compensated in a financial way. It is the education which brings a competency to serve, therefore, which is often called the utilitarian, and sometimes spoken of contemptuously as the bread-and-butter education. On the other hand the education which gives a competency to appreciate and to enjoy is commonly spoken of as a cultured education. As to which kind of education is the higher and nobler, if they must be contrasted, it all depends on the point of view. If personal pleasure and happiness are the chief end and aim in life, then for that class of persons who have no disposition to serve, the cultural education is the more worthy of admiration and selection (conditioned of course on the bodily comforts being so far provided for as to make all financial compensations of no object to the individual). If, however, service to others is the most worthy purpose in life, and if in addition such service brings the greatest happiness, then that education which develops the ability to serve, in some capacity, should be regarded as the higher and more worthy. This kind of education has the further advantage that the money consideration it brings makes its possessor a self-supporting member of society instead of a drone or parasite, which those people must be who can not serve. I never could see the force of the statement that "they also serve who only stand and wait." It is possible they may serve their own pleasures, but if this is all, the statement should be so qualified.

The higher education which leads to a life of service has been known as a professional education, as law, medicine, the ministry, teaching, and the like. These

have long been known as the learned professions. A learned profession may be defined as a vocation in which scholarly accomplishments are used in the service of society or of other individuals, for a valuable consideration. Under such a definition every new vocation in which a very considerable amount of scholarship is required for its successful prosecution, and which is placed in the service of others, must be held as a learned profession. And as engineering now demands fully as great an amount of learning, or scholarship, as any other, it has already taken a high rank among these professions, although as a learned profession it is scarcely half a century old. Engineering differs from all other learned professions, however, in this, that its learning has to do only with the inanimate world, the world of dead matter and force. The materials, the laws, and the forces of nature, and scarcely to any extent its life, are the peculiar field of the engineer. Not only is the engineer pretty thoroughly divorced from life in general, but even with that society of which he is a part his professional life has little in common. His profession is so new it practically has no past, either of history or of literature, which merits his consideration, much less his laborious study. Neither do the ordinary social or political problems enter in any way into his sphere of operations. Natural law, dead matter, and lifeless force make up his working world, and in these he lives and moves and has his professional being. Professionally regarded, what to him is the history of his own or of other races? What have the languages and the literatures of the world of value to him? What interest has he in domestic or foreign politics, or in the various social

and religious problems of the day? In short what interest is there for him in what we now commonly include in the term "the humanities"? It must be confessed that in a professional way they have little or none. Except perhaps two other modern languages by which he obtains access to the current progress in applied science, he has practically no professional interest in any of these things. His structures are made no safer or more economical; his prime-movers are no more powerful or efficient; his electrical wonders no more occult or useful; his tools no more ingenious or effective, because of a knowledge of all these humanistic affairs. As a mere server of society, therefore, an engineer is about as good a tool without all this cultural knowledge as with it. But as a citizen, as a husband and father, as a companion, and more than all, as one's own constant, perpetual, unavoidable personality, the taking into one's life of a large knowledge of the life and thought of the world, both past and present, is a very important matter indeed, and of these two kinds of education, as they affect the life-work, the professional success, and the personal happiness of the engineer, I will speak more in detail.

I am here using the term engineer as including that large class of modern industrial workers who make the new application of science to the needs of modern life their peculiar business and profession. A man of this class may also be called an applied scientist. Evidently he must have a large acquaintance with such practical sciences as surveying, physics, chemistry, geology, metallurgy, electricity, applied mechanics, kinematics, machine design, power generation and transmission, structural designing, land and water trans-

portation, etc., etc. And as a common solvent of all the problems arising in these various subjects he must have acquired an extended knowledge of mathematics, without which he would be like a sailor with neither compass nor rudder. To the engineer mathematics is a tool of investigation, a means to an end, and not the end itself. The same may be said of his physics, his chemistry, and of all his other scientific studies. They are all to be made tributary to the solution of problems which may arise in his professional career. His entire technical education, in fact, is presumably of the useful character, and acquired for specific useful ends. Similarly he needs a free and correct use of his mother-tongue, that he may express himself clearly and forcibly both in speech and composition, and an ability to read both French and German, that he may read the current technical literature in the two other languages which are most fruitful in new and original technical matter.

It is quite true that the mental development, the growth of one's mental powers and the command over the same, which comes incidentally in the acquisition of all this technical knowledge, is of far more value than the knowledge itself, and hence great care is given in all good technical schools to the mental processes of the students, and to a thorough and logical method of presentation and of acquisition. In other words, while you are under our instruction it is much more important that you should think consecutively, rationally, and logically, than that your conclusions should be numerically correct. But as soon as you leave the school the exact reverse will hold. Your employer is not concerned with your mental development, or with your

mental processes, so long as your results are correct, and hence we must pay some attention to numerical accuracy in the school, especially in the upper classes. We must remember, however, that the mind of the engineer is primarily a workshop and not a warehouse or lumber-room of mere information. Your facts are better stored in your library. Room there is not so valuable as it is in the mind, and the information, furthermore, is better preserved. Memory is as poor a reliance to the engineer as to the accountant. Both alike should consult their books when they want the exact facts. Knowledge alone is not power. The ability to use knowledge is a latent power, and the actual use of it is a power. Instead of storing your minds with useful knowledge, therefore, I will say to you, store your minds with useful tools, and with a knowledge only of how to use such tools. Then your minds will become mental workshops, well fitted for turning out products of untold value to your day and generation. Everything you acquire in your course in this college, therefore, you should look upon as mental tools with which you are equipping yourselves for your future careers. It may well be that some of your work will be useful rather for the sharpening of your wits and for the development of mental grasp, just as gymnastic exercise is of use only in developing your physical system. In this case it has served as a tool of development instead of one for subsequent use. Because all your knowledge here gained is to serve you as tools it must be acquired quantitatively rather than qualitatively. First, last, and all the time, you are required to know not *how* simply, but how much, how far, how fast, to what extent, at what cost, with what

certainty, and with what factor of safety. In the cultural education where one is learning only to appreciate and to enjoy, it may satisfy the average mind to know that coal burned under a boiler generates steam which entering a cylinder moves a piston which turns the engine, and stop with that. But the engineer must know how many heat units there are in a pound of coal burned, how many of these are generated in the furnace, how many of them pass into the water, how much steam is consumed by the engine per horse-power per hour, and finally how much effective work is done by the engine per pound of coal fed to the furnace. Merely qualitative knowledge leads to the grossest errors of judgment and is of that kind of little learning which is a dangerous thing. At my summer home I have a hydraulic ram set below a dam, for furnishing a water supply. Nearby is an old abandoned water-power grist mill. A man and his wife were looking at the ram last summer and the lady was overheard to ask what it was for. The man looked about, saw the idle water-wheel of the old mill, and ventured the opinion that it must be used to run the mill! He knew a hydraulic ram when he saw it and he knew it was used to generate power, and that power would run a mill. *Ergo,* a hydraulic ram will run a mill. This is on a par with thousands of similar errors of judgment where one's knowledge is qualitative only. All engineering problems are purely quantitative from the beginning to the end, and so are all other problems, in fact, whether material, or moral, or financial, or commercial, or social, or political, or religious.[1] All judg-

1 The student will not of course accept this statement without undertaking to work out for himself its consequences, for example, in the realms of art and morals.—EDITOR.

ments passed on such problems, therefore, must be quantitative judgments. How poorly prepared to pass such judgments are those whose knowledge is qualitative only! Success in all fields depends very largely on the accuracy of one's judgment in foreseeing events, and in engineering it depends wholly on such accuracy. An engineer must see all around his problems, and take account of every contingency which can happen in the ordinary course of events. When all such contingencies have been foreseen and provided against, then the unexpected cannot happen, as everything has been foreseen. It is customary to say, "The unexpected always happens." This of course is untrue. What is meant is "It is only the unexpected which happens," for the very good reason that what has been anticipated has been provided against.

In order that knowledge may be used as a tool in investigations and in the solution of problems, it must be so used constantly during the period of its acquisition. Hence the large amount of drawing-room, field, laboratory, and shop practice introduced into our engineering courses. We try to make theory and practice go hand in hand. In fact we teach that theory is only generalized practice. From the necessary facts, observed in special experiments or in actual practice, and which cover a sufficiently wide range of conditions, general principles are deduced from which effects of given like causes can be foreseen or derived, for new cases arising in practice. This is like saying, in surveying, that with a true and accurate hind-sight an equally true and accurate forward course can be run. Nearly all engineering knowledge, outside the pure mathematics, is of this experimental or empirical char-

acter, and we generally know who made the experiments, under what conditions, over what range of varying conditions, how accordant his results were, and hence what weight can be given to his conclusions. When we can find in our engineering literature no sufficiently accurate data, or none exactly covering the case in hand, we must set to work to make a set of experiments which will cover the given conditions, so as to obtain numerical factors, or possibly new laws, which will serve to make our calculations prove true in the completed structure or scheme. The ability to plan and carry out such crucial tests and experiments is one of the most important objects of an engineering college training, and we give our students a large amount of such laboratory practice. In all such work it is the absolute truth we are seeking and hence any guessing at data or falsifying of records, or "doctoring" of the computations is of the nature of a professional crime. Any copying of records from other observers, when students are supposed to make their own observations, is a fraud upon themselves as well as dishonest to their instructor, and indicates a disposition of mind which has nothing in common with that of the engineer, who is always and everywhere a truth-seeker and truth-tester. The sooner such a person leaves the college of engineering the better for him and for the engineering profession. Men in other professions may blunder or play false with more or less impunity. Thus the lawyer may advocate a bad cause without losing caste; a physician may blunder at will, but his mistakes are soon buried out of sight; a minister may advocate what he no longer believes himself, and feel that the cause justifies his course; but the

mistakes of the engineer are quick to find him out and to proclaim aloud his incompetence. He is the one professional man who is obliged to be right, and for whom sophistry and self-deception are a fatal poison. But the engineer must be more than honest, he must be able to discern the truth. With him an honest motive is no justification. He must not only *believe* he is right; he must *know* he is right. And it is one of the greatest elements of satisfaction in this profession, that it is commonly possible to secure in advance this almost absolute certainty of results. We deal with fixed laws and forces, and only so far as the materials used may be faulty, or of unknown character, or as contingencies could not be foreseen or anticipated, does a necessary ignorance enter into the problem.

It must not be understood, however, that with all of both the theory and practice we are able to give our students in their four- or five-year course, they will be full-fledged engineers when they leave us. They ought to be excellent material out of which, with a few years' actual practice, they would become engineers of the first order. Just as a young physician must have experience with actual patients, and as a young lawyer must have actual experience in the courts, so must an engineer have experience with real problems before he can rightfully lay claim to the title of engineer. And in seeking this professional practice they must not be too choice. As a rule the higher up one begins the sooner his promotion stops, and the lower down he begins the higher will he ultimately climb. The man at the top should know in a practical way all the work over which he is called upon to preside, and this means beginning at the bottom. Too many of our graduates

refuse to do this, and so they stop in a middle position, instead of coming into the management of the business, which position is reserved for a man who knows it all from the bottom up. Please understand that no position is too menial in the learning of a business. But as your college training has enabled you to learn a new thing rapidly, you should rapidly master these minor details of any business, and in a few years you should be far ahead of the ordinary apprentice who went to work from the grammar school or from the high school. The great opportunity for the engineer of the future is in the direction and management of our various manufacturing industries. We are about to become the world's workshop, and as competition grows sharper and as greater economies become necessary, the technically trained man will become an absolute necessity in the leading positions in all our industrial works. These are the positions hitherto held by men who have grown up with the business, but without technical training. They are being rapidly supplanted by technical men, who, however, must serve their apprenticeship in the business, from the bottom up. With this combination of theory and practice, and with the American genius for invention, and with our superb spirit of initiative and of independence, we are already setting a pace industrially which no other nation can keep, and which will soon leave all others hopelessly behind.

In the foregoing description of the technical education and work of the engineer, the engineer himself has been considered as a kind of human tool to be used in the interest of society. His service to society alone has been in contemplation. But as the engineer has

also a personality which is capable of appreciation and enjoyment of the best this world has produced in the way of literature and art; as he is to be a citizen and a man of family; and moreover, since he has a conscious self with which he must always commune and from which he cannot escape, it is well worth his while to see to it that this self, this husband and father, this citizen and neighbor, is something more than a tool to be worked in other men's interests, and that his mind shall contain a library, a parlor, and a drawing-room, as well as a workshop. And yet how many engineers' minds are all shops, out of which only shop-talk can be drawn! Such men are little more than animated tools, worked in the interest of society. They are liable to be something of a bore to their families and friends, almost a cipher in the social and religious life of the community, and a weariness to the flesh to their more liberal minded professional brethren. Their lives are one continuous grind, which has for them doubtless a certain grim satisfaction, but which is monotonous and tedious in comparison with what they might have been. Even when valued by the low standard of money-making, they are not nearly so likely to secure lucrative incomes as they would be with a greater breadth of information and worldly interest. They are likely to stop in snug professional berths which they find ready-made for them, under some sort of fixed administration, and maintain through life a subordinate relation to directing heads who, with a tithe of their technical ability, are yet able, with their worldly knowledge, their breadth of interests, and their fellowship with men, to dictate to these narrower technical subordinates, and to fix for them their fields of operation.

In order, therefore, that the technical man, who in material things knows what to do and how to do it, may be able to get the thing done and to direct the doing of it, he must be an engineer of men and of capital as well as of the materials and forces of nature. In other words he must cultivate human interests, human learning, human associations, and avail himself of every opportunity to further these personal and business relations. If he can make himself a good business man, or as good a manager of men, as he usually makes of himself in the field of engineering he has chosen, there is no place too great, and no salary too high for him to aspire to. Of such men are our greatest railroad presidents and general managers and the directors of our largest industrial establishments. While most of this kind of knowledge must also be acquired in actual practice, yet some of it can best be obtained in college. . . . The one crying weakness of our engineering graduates is ignorance of the business, the social, and the political world, and of human interests in general. They have little knowledge in common with the graduates of our literary colleges, and hence often find little pleasure in such associations. They become clannish, run mostly with men of their class, take little interest in the commercial or business departments of the establishments with which they are connected, and so become more and more fixed in their inanimate worlds of matter and force. I beseech you, therefore, while yet students, to try to broaden your interests, extend your horizons now into other fields, even but for a bird's-eye view, and profit, so far as possible, by the atmosphere of universal knowledge which you can breathe here through the entire period of

your college course. Try to find a chum who is in another department; go to literary societies; haunt the library; attend the available lectures in literature, science, and art, attend the meetings of the Science Club; and in every way possible, with a peep here and a word there, improve to the utmost these marvelous opportunities which will never come to you again. Think not of tasks; call no assignments by such a name. Call them opportunities, and cultivate a hunger and thirst for all kinds of humanistic knowledge outside your particular world of dead matter, for you will never again have such an opportunity, and you will be always thankful that you made good use of this, your one chance in a lifetime.

For your own personal happiness, and that of your immediate associates, secure in some way, either in college or after leaving the same, an acquaintance with the world's best literature, with the leading facts of history, and with the biographies of many of the greatest men in pure and applied science, as well as of statesmen and leaders in many fields. With this knowledge of great men, great thoughts, and great deeds, will come that lively interest in men and affairs which is held by educated men generally, and which will put you on an even footing with them in your daily intercourse. This kind of knowledge also elevates and sweetens the intellectual life, leads to the formation of lofty ideals, helps one to a command of good English, and in a hundred ways refines, and inspires to high and noble endeavor. This is the cultural education leading to that appreciation and enjoyment man is assumed to possess.

Think not, however, that I depreciate the peculiar

work of the engineering college. It is by this kind of education alone that America has already become supreme in nearly all lines of material advancement. I am only anxious that the men who have made these things possible shall reap their full share of the benefits.

In conclusion let me congratulate you on having selected courses of study which will bring you into the most intimate relations with the world's work of your generation. All life to-day is one endless round of scientific applications of means to ends, but such applications are still in their infancy. A decade now sees more material progress than a century did in the past. Not to be scientifically trained in these matters is equivalent to-day to a practical exclusion from all part and share in the industrial world. The entire direction of the world's industry and commerce is to be in your hands. You are also charged with making the innumerable new discoveries and inventions which will come in your generation and almost wholly through men of your class. The day of the inventor, ignorant of science and of nature's laws, has gone by. The mere mechanical contrivances have been pretty well exhausted. Henceforth profitable invention must include the use or embodiment of scientific principles with which the untrained artisan is unacquainted. More and more will invention be but the scientific application of means to ends, and this is what we teach in the engineering schools. Already our patent office is much puzzled to distinguish between engineering and invention. Since engineering proper consists in the solution of new problems in the material world, and invention is likewise the discovery of new ways of doing things,

they cover the same field. But an invention is patentable, while an engineering solution is not. Invention is supposed in law to be an inborn faculty by which new truth is conceived by no definable way of approach. If it had not been reached by this particular individual, it is assumed that it might never have been known. An engineering solution is supposed, and rightly, to have been reached by logical processes through known laws of matter, and force, and motion, so that another engineer, given the same problem, would probably have reached the same or an equivalent result. And this is not patentable. Already a very large proportion of the patents issued could be nullified on this ground, if the attorneys only knew enough to make their case. More and more, therefore, are the men of your class to be charged with the responsibility and to be credited with the honor of the world's progress, and more and more is the world's work to be placed under your direction. The world will be remade by every succeeding generation, and all by the technically educated class. These are your responsibilities and your honors. The tasks are great and great will be your rewards. That you may fitly prepare yourself for them is the hope and trust of your teachers in this college of engineering.

I will close this address by quoting Professor Huxley's definition of a liberal education. Says Huxley: "That man, I think, has had a liberal education who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that, as a mechanism, it is capable of; whose intellect is a clear, cold, logic engine, with all its parts of equal strength, and in smooth working order; ready, like a steam engine, to be turned to any

kind of work, and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truths of Nature and of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of Nature or of art, to hate all vileness, and to respect others as himself.

"Such an one and no other, I conceive, has had a liberal education; for he is, as completely as a man can be, in harmony with Nature. He will make the best of her, and she of him. They will get on together rarely: she as his ever beneficient mother; he as her mouthpiece, her conscious self, her minister and interpreter."

XI

Disinterestedness

By Francis A. Walker [1]

THE growth of scientific and technical schools on this continent during the past thirty years has savored of the marvelous. In part, it has been due to the changed ideas and the transfigured ideals of the American people; in part, to the recognized need of greater skill and more of scientific knowledge for the development of the natural resources of the continent and for the direction of its growing enterprises. In this movement of the age, even the older institutions have been compelled profoundly to modify their traditional courses of study, substituting scientific and even technical instruction for much that was formerly deemed essential to a liberal education.

1 This short address was delivered by General Walker at the dedication of the new science and engineering buildings of McGill University, Montreal, February 24, 1893. It was published in the *Technology Quarterly*, the journal of the Society of Arts of the Massachusetts Institute of Technology, in April of the same year, and is reprinted here by permission of the Secretary of the Society.

Francis Amasa Walker, 1840–1897, was a graduate of Amherst; he entered the Civil War as Sergeant-major of the 15th Massachusetts Infantry and was mustered out as Brigadier-general. He was successively a teacher, an editorial writer on the *Springfield Republican*, and an employee of the government in statistics and census work. From 1872 to 1880 he served as Professor of Political Economy in the Sheffield Scientific School of Yale University, and was President of the Massachusetts Institute of Technology from 1881 until his death in 1897.—EDITOR.

Of the reluctance, and even resistance which this movement has encountered from many who deservedly held high places in the old educational order, I would not speak with harshness. The notion that scientific work was something essentially less fine and high and noble than the pursuit of rhetoric and philosophy, Latin and Greek, was deeply seated in the minds of the leading educators of America a generation ago. And it has not even yet wholly yielded to the demonstration offered by the admirable effects of the new education in training up young men to be as modest and earnest, as sincere, manly, and pure, as broad and appreciative, as were the best products of the classical culture, and withal, more exact and resolute and strong. We can hardly hope to see that inveterate prepossession altogether disappear from the minds of those who have entertained it. Probably these good men will have to be buried with more or less of their prejudices still wrapped about them; but from the new generation scientific and technical studies will encounter no such obstruction, will suffer no such disparagement.

Another objection which the new education has encountered is entitled to far more of consideration. This has arisen from the sincere conviction of many distinguished and earnest educators that the pursuit of science, especially where its technical applications are brought strongly out, loses much of that disinterestedness which they claim, and rightly claim, is of the very essence of education. For the spirit of this objection I entertain profound respect. I only differ from these honorable gentlemen in believing that the contemplated uses of science, whether in advancing the condition of mankind, or even in promoting the ulterior usefulness,

success, and pecuniary profit of the student of a technical profession, do not necessarily impair that disinteredness which I fully concede is essential to the highest and truest education of the man. These gentlemen appear to me to have an altogether unnecessary fear of the usefulness of science. They entertain much of that dread of "Fruit," which Macaulay, in his famous essay on Bacon, doubtless with something of exaggeration, as his custom was, attributed to the old philosophers.

I am willing to admit that, in my humble judgment, many technical schools have erred in addressing themselves too closely to the practical side of instruction; that they have in some degree neglected principles in the study of science, and have borne an undue weight upon mere knacks and labor-saving devices and technical methods. I believe that in doing this they have made a mistake, even from their own point of view, and with reference to the very objects they profess. Moreover, I am free to acknowledge that those who direct many technical schools have made a mistake, in altogether, or nearly so, omitting from their curriculum philosophical as distinguished from scientific, liberal as distinguished from exact, studies. Those technical schools will best accomplish their purposes of usefulness, alike to their students and to the State, which make more of the sciences than of the arts, more of principles than of their applications, and which offer to their pupils, in addition to the studies which will make them exact and strong, some of the studies and exercises which will help to render them, at the same time, broad and fine.

With only such a subordination of technical and

scientific studies as is for the ultimate advantage of the technical professions themselves, and with such a complementing of scientific by philosophical studies as has been indicated, I believe that the work of the student in schools of technology is as fully entitled to be termed disinterested as that of a student in a classical college. In neither class of institutions can or ought the student to be unmindful that his personal success in life and his professional and social position are largely to depend upon the manner in which his work shall be done in college. All that can be asked in regard to any school is that there shall be zeal in study, delight in discovery, fidelity to the truth as it is discerned, high aims, and ambitions which have not sole or primary respect to material rewards. The strong desire to become a useful man, well equipped for life, capable of doing good work, respected and entitled to respect, constitutes no breach of disinterestedness, in any sense of that word in which an educator would be justified in using it with commendation.

The practical uselessness for any immediate purpose of a given subject of study may be no reason why it should not be pursued; but, on the other hand, the high immediate usefulness of a subject of study furnishes no ground from which the educator of loftiest aims and purest ideals should regard it with contempt or distrust. In either case, the question of real import is in what spirit the study is pursued. The most distinguished French writer of to-day on matters of education, writing, too, in advocacy not of physical but of social science, has frankly paid his tribute to the disinterestedness of spirit and loftiness of motive

which promote and direct scientific research, even in its most practical applications. "Let us," he says, "pass in review the great founders of modern science and the creators of industry, the Keplers and the Fultons, and we shall be struck by the idealistic and even Utopian tendency peculiar to them. They are, in their own way, dreamers, artists, poets, controlled by experience."

And if, leaving abstract reasoning, we turn to contemplate the manner in which the several professions are practiced in the community, I seem to find corroboration of the view that the study of science and its applications to the arts of life do not tend to produce sordid character or to confine the man merely to material aims. Every profession has its black sheep and its doubtful practitioners; but, while frankly admitting that there are mercenary physicists and chemists for revenue only, I boldly challenge comparison between the scientific men of America, as a body, and its literary men or even its artists, in the respects of devotion to truth, of simple confidence in the right, of delight in good work for good work's sake, of indisposition to coin name and fame into money, of unwillingness to use one thing that is well done as a means of passing off upon the public three or four things that are ill done. I know the scientific men of America well, and I entertain a profound conviction that in sincerity, simplicity, fidelity, and generosity of character, in nobility of aims and earnestness of effort, in everything which should be involved in the conception of disinterestedness, they are surpassed, if indeed they are approached, by no other body of men.

Let us, then, cheer on every enterprise for the extension of scientific and technical education, without any misgivings as to its effects upon the character and subsequent life of the young men of America, without any fear that they will be rendered sordid in spirit or low in their aims by reason of the practical usefulness of the studies to which they are called to apply themselves. There is a wonderful virtue in the exact sciences to make their students loyal, just-minded, clear-headed, and strong against temptation. Here, no insidious tendencies to mere plausibility, to sophistry, and to self-delusion beset the young and the ambitious. The only success here is to be right. The only failure possible is to be wrong. To be brilliant in error here is only to make the fact of error more conspicuous and more ludicrous. Nothing but the truth, nothing less than the whole truth, this is the dominating spirit of the laboratory, which never withdraws its control over the student to keep him from the false path, which never intermits its inspiration as it urges him onward to the light.

XII

The Professional Demand

By C. R. Mann [1]

At the first meeting of the Joint Committee on Engineering Education with the representatives of the Carnegie Foundation for the Advancement of Teaching, the importance of securing from practitioners a clear statement of the professional requirements of engineering was emphasized. A number of interviews with representative engineers revealed the fact that men of strong character and common-sense are generally much preferred to men of high scholastic attainments. This result was so unexpected, that it seemed necessary to confirm or refute it by a wider expression of opinion than is possible by means of personal inter-

1 This statement is taken from the report prepared by Dr. C. R. Mann of his study of engineering education made on behalf of the five American National Engineering societies and of the Carnegie Foundation. This part of Dr. Mann's investigation — which, taken as a whole, is the most thorough and comprehensive study of engineering schools ever made in this country — is especially illuminating to the young student from the fact that it states with an authority which no individual man can possess what the qualities are which the practical engineer values most in the young graduate. The breadth, sanity, and humanity of the views of practical engineers on this question, as codified by Dr. Mann, offer eloquent testimony to the high intellectual and moral level of the profession today.

C. R. Mann was born in 1869, educated at Columbia and the University of Berlin, and is at present a member of the Physics Department of the University of Chicago. He has been on leave of absence since 1914 engaged in making his study of engineering schools.—Editor.

views. Hence in March, 1915, a circular letter was addressed to the members of the national engineering societies.

This letter asked the engineeers first to mention the points at which the work of the schools seems to be either effective or ineffective; second, to name the most important factors in determining probable success or failure in engineering, and to describe the best methods of finding out whether a young man has the necessary traits or not; and third, to make suggestions as to how the schools might be strengthened.

Altogether 1400 replies were received, 789 from civil engineers, 374 from electrical engineers, 199 from mechanical engineers, and 38 from unclassified engineers. Every state in the Union was represented and 63 came from abroad. The answers also give further insight into the status of their authors, since they contain statements of personal experience. Though these are too general and varied to permit of summarization, they show that the letters came from men who have been successful in engineering, who have attained positions of authority in which they have had wide experience in employing college graduates, and who therefore have well defined ideas on the questions raised.

The summary of the replies shows that there is only one thing in which the majority of those who replied think the school work is effective, and that is in imparting knowledge of the sciences on which engineering is based. About one-quarter of the answers also mention training in methods of analytical thinking as one of the successful efforts of the schools. A few more believe that some ambition and enthusiasm

are developed by the college work. On the other hand, present school methods seem less effective to some ten or fifteen per cent of those who replied, in training to efficient and motivated work, and in developing initiative, resourcefulness, responsibility, accuracy, thoroughness, common-sense, and a broad view of life. Nearly one-third of the answers complain of the engineer's inability to express himself well in speech and writing; more than half complain of the young graduate's inability to apply the theory he has learned to practice; and about one-third would be better satisfied if the budding engineer knew more than he does about business methods and practice.

The 1400 answers mention every conceivable human characteristic as essential to success. These have been arranged in the following six groups. The figures show the number of times the factors in each group appeared in the letters.

Character, integrity, responsibility, resourcefulness, initiative	2826
Judgment, common-sense, scientific attitude, perspective	1212
Efficiency, thoroughness, accuracy, industry	1191
Understanding of men, executive ability	1007
Knowledge of the fundamentals of engineering science	478
Technique of practice and of business	398

The first group contains the various qualities that express the moral attitude of the man. The second contains the qualities that are related to his reasoning processes. The qualities in the third group are expressed in the way the man works with things, and those in the fourth group are manifested by his manner of dealing with men. The contents of the fifth and sixth groups are self-explanatory. Many more words

than those here given appear in the letters, but the essential ideas have been retained in the summary.

About half of the answers say that the record of experience in practical work is the best criterion for judging of a young man's prospects. But few college graduates have such experience to show; then the personal impression he makes is regarded as the next best means of sizing up a candidate for a job. The school record is given third place in this list, followed by information as to how he spends his spare time and personal references from acquaintances.

The most important facts disclosed by this summary are, first, that the only thing in which the schools are judged to be successful by a majority of those voting is "imparting technical knowledge"; and second, that in stating the factors essential to success, the personal and common-sense qualities are mentioned about five times as often as is knowledge of theory and of practice. The opinions of these 1400 engineers thus substantiate the results of the personal interviews. But notwithstanding this agreement, it seemed necessary again to refer the vital question involved to the engineering profession. For if the schools are concentrating their attention on imparting information, without a conscious effort to develop character and judgment, far-reaching changes in school methods will have to be made. It would, therefore, be unwise to use the conclusion as a standard of criticizing and suggesting, without further confirmation. Hence in April, 1916, a second letter was addressed to the members of the national engineering societies.

This second letter presented the six groups of

factors essential to success as just given and asked each man to number them in what he considered to be their importance in determining success in engineering. Altogether 7038 engineers voted on the relative importance of the six groups. Character was voted to first place by an average majority of 94.5% and Technique was given last place by an average majority of 93.4%. The other groups retained their original positions by votes ranging from 56% to 82%. The ballots were sorted according to the numbers of years of practical experience of the voters and counted separately for each ten-year period. But though the votes on the different items ranged from 56% to 98%, the vote for any given item varied less than 5% for differences in experience. Because of this constancy of the vote on each item it is clear that this statement corresponds to a rather definite ideal in the professional mind. It is therefore safe to use it in testing and planning the work of the schools.

When applying this definition to the schools it is desirable not to forget several perfectly obvious facts. In the first place, all the qualities mentioned are essential to genuine success, and conscious effort should be made to develop all of them as far as is possible. Second, character, initiative, common-sense, and qualities of this sort cannot be taught explicitly like multiplication tables and rules of grammar. Third, education is a continuous process of growth, and therefore the conscious development of the qualities of the first four groups cannot to advantage be arrested for four years, even for the sake of a mastery of knowledge and technique. Fourth, the man whose character, judg-

ment, efficiency, and understanding of men has developed most during his college years has the best chance after graduation.

This seems an elaborate means of verifying such an old and self-evident thesis as that man is greater than his knowledge. Yet in spite of its venerable age and its frequent neglect by the schools, this thesis is still the guiding principle of sound educational practice. The engineering profession can render no greater service to education than by constantly reminding the schools in this age of bewildering technique that the development of character, judgment, and human sympathy is the ultimate end and aim of education. Because of the unprecedented development of both the mechanic arts and the educative arts in the past fifty years, the amount of technical detail that must be mastered by any one who would win success in either field is so vast and so complicated that few can hope to achieve excellence in both. Hence in general the advice of the engineer about the technical details of teaching is no more valuable than the schoolmaster's advice about the technical details of engineering. The professor and the practitioner can however be of enormous help to each other in determining ideals, aims, ends and purposes, especially at the present moment when far-sighted men with profound faith in humanity are more than ever needed in managing the practical affairs of life.

From the point of view of imparting technical information, the engineering schools are undoubtedly among the most efficient of our present educational institutions. This is partly due to the importance that attaches to efficiency in all engineering work. For

them, efficiency is bred in the bone and finds expression in everything related to the profession. Moreover, an engineer cannot bluff the laws of nature or bury his mistakes. Working as he must in the open and compelled as he is to create structures that must meet the test of a real try-out before the public, the engineer is held by conditions intrinsic to his work to a standard of practical achievement that has so far made it unnecessary to license him for public protection as is done with doctors and lawyers.

But the fact that the engineering schools stand high among educational institutions as regards imparting technical information must not be interpreted to mean that their efficiency with respect to the general educational ideal as defined by the demands of the engineering profession cannot be enormously increased. The best locomotives convert less than six per cent of the heat energy of the coal into useful work. Does it follow that the efficiency of the locomotive cannot be increased?

Again schools of applied science have contributed much to the progress of invention and discovery that have drawn men physically so close together and added so much to the comfort and pleasure of life. For years we have taken just pride in this rapidly extending mastery of material things and can no longer realize how men ever lived without railroads, steamboats, telephones, trolleys, automobiles, "movies" and phonographs. The per capita wealth has also increased in fifty years from $500 to $1900. So intimate have our physical relations become, that we had settled down to the belief that the brotherhood of man was an accomplished fact and that war was well-nigh unthinkable.

But suddenly we are brought face to face with a new and startling situation. While still blinded by the faith that this binding together of men physically had made war impossible, the Pentecost of Calamity burst upon us like a thunderbolt from a clear sky. The feelings of astonishment aroused by this catastrophe have now given way to an earnest search for its meaning. In particular, what is its significance to the engineering schools?

That it has given added impulse to the industrial urge and brought home a wider appreciation of the need of co-ordinating industrial enterprise and scientific research, all must recognize. No other interpretation can be given to the organization of the Naval Consulting Board, the National Research Council, and the joint committee on co-operation of the National Academy of Science and the National Engineering Societies.

Fundamentally essential as are these activities, are they all that should be undertaken for strengthening the foundations of the country's prosperity? Have the schools no other opportunity for service besides that of expanding and co-ordinating their research work, of intensifying their emphasis on scientific investigation for the mere increase of knowledge among men? Such work will lead to an increased mastery over materials. It will strengthen our earth-grip and result in greater convenience and comfort of life. This is all good. But will this further exaltation of the mechanic arts alone prevent men from utilizing the added skill and knowledge for murderous purposes? Will it develop those moral qualities without which increased technical skill is as much a menace as a blessing?

The professional demand identifies the aim of engineering education with the aim of all education, namely, the development of men of character and of practical ability. The conditions under which this must now be done are, however, new and inspiring. For research in natural science has resulted not only in increased dominion over nature for the benefit of mankind, but also in new conceptions of society and a new philosophy of life. The schools are trying to keep pace with these changes by adding to the old units of learning new subjects of study, and by building these discrete bundles of knowledge into special courses to meet specific demands. The net result is an inorganic composite in which the cultural and the utilitarian exist side by side as rivals for the student's time. Scientific investigation has only just begun to transform the methods and aims of all instruction as it has transformed the methods and aims of living. We are just beginning to discover how college studies may be made socially serviceable and manual labor intellectually fruitful.

The solution of these problems will require much careful experimenting and study on the part of teachers; but as progress is made the schools will find that they are each year better able to meet the demands of the engineering profession. For character, judgment, efficiency, and an understanding of men — those personal qualities that make up so large a portion of the engineer's equipment — develop best in men who love their work and who labor with enthusiasm and intelligence at things which they know to be worth while.

XIII

On the Advisableness of Improving Natural Knowledge

By Thomas Henry Huxley [1]

THIS time two hundred years ago — in the beginning of January, 1666 — those of our forefathers who inhabited this great and ancient city, took breath between the shocks of two fearful calamities: one not quite past, although its fury had abated; the other to come.

Within a few yards of the very spot on which we are assembled, so the tradition runs, that painful and deadly malady, the plague, appeared in the latter months of 1664; and, though no new visitor, smote the people of England, and especially of her capital, with a violence unknown before, in the course of the follow-

1 This address was first delivered in London in 1866; it was later printed in the *Fortnightly Review,* and eventually included in the volume of Huxley's essays called *Method and Results.* Thomas Henry Huxley, 1825–1895, was educated for the medical profession, but spent his life in investigating, teaching, and popularizing natural science. His able championship of the Darwinian hypothesis earned him the nickname of "Darwin's bull-dog." He never ceased to advocate the study of science in schools and to him is due a large share of credit for educational reforms in this direction. This essay, and the one on "Science and Culture" below, show at once how high and how reasonable was his conception of the place of science in education. Huxley's comments in "Science and Culture" on Arnold's ideas and Arnold's reply in the following essay serve to define clearly the position which each held.—EDITOR.

ing year. The hand of a master has pictured what happened in those dismal months; and in that truest of fictions, *The History of the Plague Year,* Defoe shows death, with every accompaniment of pain and terror, stalking through the narrow streets of old London, and changing their busy hum into a silence broken only by the wailing of the mourners of fifty thousand dead; by the woeful denunciations and mad prayers of fanatics; and by the madder yells of despairing profligates.

But, about this time in 1666, the death-rate had sunk to nearly its ordinary amount; a case of plague occurred only here and there, and the richer citizens who had flown from the pest had returned to their dwellings. The remnant of the people began to toil at the accustomed round of duty, or of pleasure; and the stream of city life bid fair to flow back along its old bed, with renewed and uninterrupted vigor.

The newly-kindled hope was deceitful. The great plague, indeed, returned no more; but what it had done for the Londoners, the great fire, which broke out in the autumn of 1666, did for London; and, in September of that year, a heap of ashes and the indestructible energy of the people were all that remained of the glory of five-sixths of the city within the walls.

Our forefathers had their own ways of accounting for each of these calamities. They submitted to the plague in humility and in penitence, for they believed it to be the judgment of God. But, towards the fire they were furiously indignant, interpreting it as the effect of the malice of man,— as the work of the

Republicans, or of the Papists, according as their prepossessions ran in favor of loyalty or of Puritanism.

It would, I fancy, have fared but ill with one who, standing where I now stand, in what was then a thickly-peopled and fashionable part of London, should have broached to our ancestors the doctrine which I now propound to you — that all their hypotheses were alike wrong; that the plague was no more, in their sense, Divine judgment, than the fire was the work of any political, or of any religious, sect; but that they were themselves the authors of both plague and fire, and that they must look to themselves to prevent the recurrence of calamities, to all appearance so peculiarly beyond the reach of human control — so evidently the result of the wrath of God, or of the craft and subtlety of an enemy.

And one may picture to one's self how harmoniously the holy cursing of the Puritan of that day would have chimed in with the unholy cursing and the crackling wit of the Rochesters and Sedleys, and with the revilings of the political fanatics, if my imaginary plain dealer had gone on to say that, if the return of such misfortunes were ever rendered impossible, it would not be in virtue of the victory of the faith of Laud, or of that of Milton; and, as little, by the triumph of republicanism, as by that of monarchy. But that the one thing needful for compassing this end was, that the people of England should second the efforts of an insignificant corporation, the establishment of which, a few years before the epoch of the great plague and the great fire, had been as little noticed, as they were conspicuous.

Some twenty years before the outbreak of the plague a few calm and thoughtful students banded themselves together for the purpose, as they phrased it, of "improving natural knowledge." The ends they proposed to attain cannot be stated more clearly than in the words of one of the founders of the organization: —

"Our business was (precluding matters of theology and state affairs) to discourse and consider of philosophical inquiries, and such as related thereunto: — as Physick, Anatomy, Geometry, Astronomy, Navigation, Staticks, Magneticks, Chymicks, Mechanicks, and Natural Experiments; with the state of these studies and their cultivation at home and abroad. We then discoursed of the circulation of the blood, the valves in the veins, the venæ lacteæ, the lymphatic vessels, the Copernican hypothesis, the nature of comets and new stars, the satellites of Jupiter, the oval shape (as it then appeared) of Saturn, the spots on the sun and its turning on its own axis, the inequalities and selenography of the moon, the several phases of Venus and Mercury, the improvement of telescopes and grinding of glasses for that purpose, the weight of air, the possibility or impossibility of vacuities and nature's abhorrence thereof, the Torricellian experiment in quicksilver, the descent of heavy bodies and the degree of acceleration therein, with divers other things of like nature, some of which were then but new discoveries, and others not so generally known and embraced as now they are; with other things appertaining to what hath been called the New Philosophy, which from the times of Galileo at Florence, and Sir Francis Bacon (Lord Verulam) in England, hath been much culti-

vated in Italy, France, Germany, and other parts abroad, as well as with us in England."

The learned Dr. Wallis, writing in 1696, narrates in these words, what happened half a century before, or about 1645. The associates met at Oxford, in the rooms of Dr. Wilkins, who was destined to become a bishop; and subsequently coming together in London, they attracted the notice of the king. And it is a strange evidence of the taste for knowledge which the most obviously worthless of the Stuarts shared with his father and grandfather, that Charles the Second was not content with saying witty things about his philosophers, but did wise things with regard to them. For he not only bestowed upon them such attention as he could spare from his poodles and his mistresses, but, being in his usual state of impecuniosity, begged for them of the Duke of Ormond; and, that step being without effect, gave them Chelsea College, a charter, and a mace: crowning his favors in the best way they could be crowned, by burdening them no further with royal patronage or state interference.

Thus it was that the half-dozen young men, studious of the "New Philosophy," who met in one another's lodgings in Oxford or in London, in the middle of the seventeenth century, grew in numerical and in real strength, until, in its latter part, the "Royal Society for the Improvement of Natural Knowledge" had already become famous, and had acquired a claim upon the veneration of Englishmen, which it has ever since retained, as the principal focus of scientific activity in our islands, and the chief champion of the cause it was formed to support.

It was by the aid of the Royal Society that Newton

published his *Principia*. If all the books in the world, except the *Philosophical Transactions*, were destroyed, it is safe to say that the foundations of physical science would remain unshaken, and that the vast intellectual progress of the last two centuries would be largely, though incompletely, recorded. Nor have any signs of halting or of decrepitude manifested themselves in our own times. As in Dr. Wallis's days, so in these, "our business is, precluding theology and state affairs, to discourse and consider of philosophical inquiries." But our "Mathematick" is one which Newton would have to go to school to learn; our "Staticks, Mechanicks, Magneticks, Chymicks, and Natural Experiments" constitute a mass of physical and chemical knowledge, a glimpse at which would compensate Galileo for the doings of a score of inquisitorial cardinals; our "Physsick" and "Anatomy" have embraced such infinite varieties of being, have laid open such new worlds in time and space, have grappled, not unsuccessfully, with such complex problems, that the eyes of Vesalius and of Harvey might be dazzled by the sight of the tree that has grown out of their grain of mustard seed.

The fact is perhaps rather too much, than too little, forced upon one's notice, nowadays, that all this marvelous intellectual growth has a no less wonderful expression in practical life; and that, in this respect, if in no other, the movement symbolized by the progress of the Royal Society stands without a parallel in the history of mankind.

A series of volumes as bulky as the *Transactions of the Royal Society* might possibly be filled with the subtle speculations of the Schoolmen; not improbably, the obtaining a mastery over the products of mediæval

thought might necessitate an even greater expenditure of time and of energy than the acquirement of the "New Philosophy"; but though such work engrossed the best intellects of Europe for a longer time than has elapsed since the great fire, its effects were "writ in water," so far as our social state is concerned.

On the other hand, if the noble first President of the Royal Society could revisit the upper air and once more gladden his eyes with a sight of the familiar mace, he would find himself in the midst of a material civilization more different from that of his day, than that of the seventeenth was from that of the first century. And if Lord Brouncker's native sagacity had not deserted his ghost, he would need no long reflection to discover that all these great ships, these railways, these telegraphs, these factories, these printing-presses, without which the whole fabric of modern English society would collapse into a mass of stagnant and starving pauperism,— that all these pillars of our State are but the ripples and the bubbles upon the surface of that great spiritual stream, the springs of which only, he and his fellows were privileged to see; and seeing, to recognize as that which it behoved them above all things to keep pure and undefiled.

It may not be too great a flight of imagination to conceive our noble *revenant* not forgetful of the great troubles of his own day, and anxious to know how often London had been burned down since his time, and how often the plague had carried off its thousands. He would have to learn that, although London contains tenfold the inflammable matter that it did in 1666; though, not content with filling our rooms with

woodwork and light draperies, we must needs lead inflammable and explosive gases into every corner of our streets and houses, we never allow even a street to burn down. And if he asked how this had come about, we should have to explain that the improvement of natural knowledge has furnished us with dozens of machines for throwing water upon fires, any one of which would have furnished the ingenious Mr. Hooke, the first "curator and experimenter" of the Royal Society, with ample materials for discourse before half a dozen meetings of that body; and that, to say truth, except for the progress of natural knowledge, we should not have been able to make even the tools by which these machines are constructed. And, further, it would be necessary to add, that although severe fires sometimes occur and inflict great damage, the loss is very generally compensated by societies, the operations of which have been rendered possible only by the progress of natural knowledge in the direction of mathematics, and the accumulation of wealth in virtue of other natural knowledge.

But the plague? My Lord Brouncker's observation would not, I fear, lead him to think that Englishmen of the nineteenth century are purer in life, or more fervent in religious faith, than the generation which could produce a Boyle, an Evelyn, and a Milton. He might find the mud of society at the bottom, instead of at the top, but I fear that the sum total would be as deserving of swift judgment as at the time of the Restoration. And it would be our duty to explain once more, and this time not without shame, that we have no reason to believe that it is the improvement of our faith, nor that of our morals, which keeps the

plague from our city; but, again, that it is the improvement of our natural knowledge.

We have learned that pestilences will only take up their abode among those who have prepared unswept and ungarnished residences for them. Their cities must have narrow, unwatered streets, foul with accumulated garbage. Their houses must be ill-drained, ill-lighted, ill-ventilated. Their subjects must be ill-washed, ill-fed, ill-clothed. The London of 1665 was such a city. The cities of the East, where plague has an enduring dwelling, are such cities. We, in later times, have learned somewhat of Nature, and partly obey her. Because of this partial improvement of our natural knowledge and of that fractional obedience, we have no plague; because that knowledge is still very imperfect and that obedience yet incomplete, typhoid is our companion and cholera our visitor. But it is not presumptuous to express the belief that, when our knowledge is more complete and our obedience the expression of our knowledge, London will count her centuries of freedom from typhoid and cholera, as she now gratefully reckons her two hundred years of ignorance of that plague which swooped upon her thrice in the first half of the seventeenth century.

Surely, there is nothing in these explanations which is not fully borne out by the facts? Surely, the principles involved in them are now admitted among the fixed beliefs of all thinking men? Surely, it is true that our countrymen are less subject to fire, famine, pestilence, and all the evils which result from a want of command over and due anticipation of the course of Nature, than were the countrymen of Milton; and health, wealth, and well-being are more abundant with

us than with them? But no less certainly is the difference due to the improvement of our knowledge of Nature, and the extent to which that improved knowledge has been incorporated with the household words of men, and has supplied the springs of their daily actions.

Granting for a moment, then, the truth of that which the depreciators of natural knowledge are so fond of urging, that its improvement can only add to the resources of our material civilization; admitting it to be possible that the founders of the Royal Society themselves looked for no other reward than this, I cannot confess that I was guilty of exaggeration when I hinted, that to him who had the gift of distinguishing between prominent events and important events, the origin of a combined effort on the part of mankind to improve natural knowledge might have loomed larger than the Plague and have outshone the glare of the Fire; as a something fraught with a wealth of beneficence to mankind, in comparison with which the damage done by those ghastly evils would shrink into insignificance.

It is very certain that for every victim slain by the plague, hundreds of mankind exist and find a fair share of happiness in the world by the aid of the spinning jenny. And the great fire, at its worst, could not have burned the supply of coal, the daily working of which, in the bowels of the earth, made possible by the steam pump, gives rise to an amount of wealth to which the millions lost in old London are but as an old song.

But spinning jenny and steam pump are, after all,

but toys, possessing an accidental value; and natural knowledge creates multitudes of more subtle contrivances, the praises of which do not happen to be sung because they are not directly convertible into instruments for creating wealth. When I contemplate natural knowledge squandering such gifts among men, the only appropriate comparison I can find for her is, to liken her to such a peasant woman as one sees in the Alps, striding ever upward, heavily burdened, and with mind bent only on her home; but yet without effort and without thought, knitting for her children. Now stockings are good and comfortable things, and the children will undoubtedly be much the better for them; but surely it would be short-sighted, to say the least of it, to depreciate this toiling mother as a mere stocking-machine — a mere provider of physical comforts?

However, there are blind leaders of the blind, and not a few of them, who take this view of natural knowledge, and can see nothing in the bountiful mother of humanity but a sort of comfort-grinding machine. According to them, the improvement of natural knowledge always has been, and always must be, synonymous with no more than the improvement of the material resources and the increase of the gratifications of men.

Natural knowledge is, in their eyes, no real mother of mankind, bringing them up with kindness, and, if need be, with sternness, in the way they should go, and instructing them in all things needful for their welfare; but a sort of fairy god-mother, ready to furnish her pets with shoes of swiftness, swords of sharpness, and omnipotent Aladdin's lamps, so that they may have

telegraphs to Saturn, and see the other side of the moon, and thank God they are better than their benighted ancestors.

If this talk were true, I, for one, should not greatly care to toil in the service of natural knowledge. I think I would just as soon be quietly chipping my own flint ax, after the manner of my forefathers a few thousand years back, as be troubled with the endless malady of thought which now infests us all, for such reward. But I venture to say that such views are contrary alike to reason and to fact. Those who discourse in such fashion seem to me to be so intent upon trying to see what is above Nature, or what is behind her, that they are blind to what stares them in the face in her.

I should not venture to speak thus strongly if my justification were not to be found in the simplest and most obvious facts,— if it needed more than an appeal to the most notorious truths to justify my assertion, that the improvement of natural knowledge, whatever direction it has taken, and however low the aims of those who may have commenced it — has not only conferred practical benefits on men, but, in so doing, has effected a revolution in their conceptions of the universe and of themselves, and has profoundly altered their modes of thinking and their views of right and wrong. I say that natural knowledge, seeking to satisfy natural wants, has found the ideas which can alone still spiritual cravings. I say that natural knowledge, in desiring to ascertain the laws of comfort, has been driven to discover those of conduct, and to lay the foundations of a new morality.

Let us take these points separately; and first, what great ideas has natural knowledge introduced into men's minds?

I cannot but think that the foundations of all natural knowledge were laid when the reason of man first came face to face with the facts of Nature; when the savage first learned that the fingers of one hand are fewer than those of both; that it is shorter to cross a stream than to head it; that a stone stops where it is unless it be moved, and that it drops from the hand which lets it go; that light and heat come and go with the sun; that sticks burn away in a fire; that plants and animals grow and die; that if he struck his fellow savage a blow he would make him angry, and perhaps get a blow in return, while if he offered him a fruit he would please him, and perhaps receive a fish in exchange. When men had acquired this much knowledge, the outlines, rude though they were, of mathematics, of physics, of chemistry, of biology, of moral, economical, and political science, were sketched. Nor did the germ of religion fail when science began to bud. Listen to words which, though new, are yet three thousand years old: —

> ". . . When in heaven the stars about the moon
> Look beautiful, when all the winds are laid,
> And every height comes out, and jutting peak
> And valley, and the immeasurable heavens
> Break open to their highest, and all the stars
> Shine, and the shepherd gladdens in his heart." [1]

If the half savage Greek could share our feelings thus far, it is irrational to doubt that he went further, to find as we do, that upon that brief gladness there fol-

[1] Need it be said that this is Tennyson's English for Homer's Greek?

lows a certain sorrow,— the little light of awakened human intelligence shines so mere a spark amidst the abyss of the unknown and unknowable; seems so insufficient to do more than illuminate the imperfections that cannot be remedied, the aspirations that cannot be realized, of man's own nature. But in this sadness, this consciousness of the limitation of man, this sense of an open secret which he cannot penetrate, lies the essence of all religion; and the attempt to embody it in the forms furnished by the intellect is the origin of the higher theologies.

Thus it seems impossible to imagine but that the foundations of all knowledge — secular or sacred — were laid when intelligence dawned, though the superstructure remained for long ages so slight and feeble as to be compatible with the existence of almost any general view respecting the mode of governance of the universe. No doubt, from the first, there were certain phenomena which, to the rudest mind, presented a constancy of occurrence, and suggested that a fixed order ruled, at any rate, among them. I doubt if the grossest of Fetish worshipers ever imagined that a stone must have a god within it to make it fall, or that a fruit had a god within it to make it taste sweet. With regard to such matters as these, it is hardly questionable that mankind from the first took strictly positive and scientific views.

But, with respect to all the less familiar occurrences which present themselves, uncultured man, no doubt, has always taken himself as the standard of comparison, as the center and measure of the world; nor could he well avoid doing so. And finding that his apparently uncaused will has a powerful effect in giving rise

to many occurrences, he naturally enough ascribed other and greater events to other and greater volitions, and came to look upon the world and all that therein is, as the product of the volitions of persons like himself, but stronger, and capable of being appeased or angered, as he himself might be soothed or irritated. Through such conceptions of the plan and working of the universe all mankind have passed, or are passing. And we may now consider what has been the effect of the improvement of natural knowledge on the views of men who have reached this stage, and who have begun to cultivate natural knowledge with no desire but that of "increasing God's honor and bettering man's estate."

For example, what could seem wiser, from a mere material point of view, more innocent, from a theological one, to an ancient people, than that they should learn the exact succession of the seasons, as warnings for their husbandmen; or the position of the stars, as guides to their rude navigators? But what has grown out of this search for natural knowledge of so merely useful a character? You all know the reply. Astronomy,— which of all sciences has filled men's minds with general ideas of a character most foreign to their daily experience, and has, more than any other, rendered it impossible for them to accept the beliefs of their fathers. Astronomy,— which tells them that this so vast and seemingly solid earth is but an atom among atoms, whirling, no man knows whither, through illimitable space; which demonstrates that what we call the peaceful heaven above us, is but that space, filled by an infinitely subtle matter whose particles are seething and surging, like the waves of an

angry sea; which opens up to us infinite regions where nothing is known, or ever seems to have been known, but matter and force, operating according to rigid rules; which leads us to contemplate phenomena the very nature of which demonstrates that they must have had a beginning, and that they must have an end, but the very nature of which also proves that the beginning was, to our conceptions of time, infinitely remote, and that the end is as immeasurably distant.

But it is not alone those who pursue astronomy who ask for bread and receive ideas. What more harmless than the attempt to lift and distribute water by pumping it; what more absolutely and grossly utilitarian? Yet out of pumps grew the discussions about Nature's abhorrence of a vacuum; and then it was discovered that Nature does not abhor a vacuum, but that air has weight; and that notion paved the way for the doctrine that all matter has weight, and that the force which produces weight is co-extensive with the universe,— in short, to the theory of universal gravitation and endless force. While learning how to handle gases led to the discovery of oxygen, and to modern chemistry, and to the notion of the indestructibility of matter.

Again, what simpler, or more absolutely practical, than the attempt to keep the axle of a wheel from heating when the wheel turns round very fast? How useful for carters and gig drivers to know something about this; and how good were it, if any ingenious person would find out the cause of such phenomena, and thence educe a general remedy for them. Such an ingenious person was Count Rumford; and he and his successors have landed us in the theory of the

persistence, or indestructibility, of force. And in the infinitely minute, as in the infinitely great, the seekers after natural knowledge of the kinds called physical and chemical, have everywhere found a definite order and succession of events which seem never to be infringed.

And how has it fared with "Physick" and Anatomy? Have the anatomist, the physiologist, or the physician, whose business it has been to devote themselves assiduously to that eminently practical and direct end, the alleviation of the sufferings of mankind,— have they been able to confine their vision more absolutely to the strictly useful? I fear they are the worst offenders of all. For if the astronomer has set before us the infinite magnitude of space, and the practical eternity of the duration of the universe; if the physical and chemical philosophers have demonstrated the infinite minuteness of its constituent parts, and the practical eternity of matter and of force; and if both have alike proclaimed the universality of a definite and predicable order and succession of events, the workers in biology have not only accepted all these, but have added more startling theses of their own. For, as the astronomers discover in the earth no center of the universe, but an eccentric speck, so the naturalists find man to be no center of the living world, but one amidst endless modifications of life; and as the astronomer observes the mark of practically endless time set upon the arrangements of the solar system so the student of life finds the records of ancient forms of existence peopling the world for ages, which, in relation to human experience, are infinite.

Furthermore, the physiologist finds life to be as

dependent for its manifestation on particular molecular arrangements as any physical or chemical phenomenon; and wherever he extends his researches, fixed order and unchanging causation reveal themselves, as plainly as in the rest of Nature.

Nor can I find that any other fate has awaited the germ of Religion. Arising, like all other kinds of knowledge, out of the action and interaction of man's mind, with that which is not man's mind, it has taken the intellectual coverings of Fetishism or Polytheism; of Theism or Atheism; of Superstition or Rationalism. With these, and their relative merits and demerits, I have nothing to do; but this it is needful for my purpose to say, that if the religion of the present differs from that of the past, it is because the theology of the present has become more scientific than that of the past; because it has not only renounced idols of wood and idols of stone, but begins to see the necessity of breaking in pieces the idols built up of books and traditions and fine-spun ecclesiastical cobwebs: and of cherishing the noblest and most human of man's emotions, by worship "for the most part of the silent sort" at the altar of the Unknown.

Such are a few of the new conceptions implanted in our minds by the improvement of natural knowledge. Men have acquired the ideas of the practically infinite extent of the universe and of its practical eternity; they are familiar with the conception that our earth is but an infinitesimal fragment of that part of the universe which can be seen; and that, nevertheless, its duration is, as compared with our standards of time, infinite. They have further acquired the idea that man is but one of innumerable forms of life now exist-

ing on the globe, and that the present existences are but the last of an immeasurable series of predecessors. Moreover, every step they have made in natural knowledge has tended to extend and rivet in their minds the conception of a definite order of the universe — which is embodied in what are called, by an unhappy metaphor, the laws of Nature — and to narrow the range and loosen the force of men's belief in spontaneity, or in changes other than such as arise out of that definite order itself.

Whether these ideas are well or ill founded is not the question. No one can deny that they exist, and have been the inevitable outgrowth of the improvement of natural knowledge. And if so, it cannot be doubted that they are changing the form of men's most cherished and most important convictions.

And as regards the second point — the extent to which the improvement of natural knowledge has remodeled and altered what may be termed the intellectual ethics of men,— what are among the moral convictions most fondly held by barbarous and semi-barbarous people?

They are the convictions that authority is the soundest basis of belief; that merit attaches to a readiness to believe; that the doubting disposition is a bad one, and skepticism a sin; that when good authority has pronounced what is to be believed, and faith has accepted it, reason has no further duty. There are many excellent persons who yet hold by these principles, and it is not my present business, or intention, to discuss their views. All I wish to bring clearly before your minds is the unquestionable fact, that the improve-

ment of natural knowledge is effected by methods which directly give the lie to all these convictions, and assume the exact reverse of each to be true.

The improver of natural knowledge absolutely refuses to acknowledge authority, as such. For him, skepticism is the highest of duties; blind faith the one unpardonable sin. And it cannot be otherwise, for every great advance in natural knowledge has involved the absolute rejection of authority, the cherishing of the keenest skepticism, the annihilation of the spirit of blind faith; and the most ardent votary of science holds his firmest convictions, not because the men he most venerates hold them; not because their verity is testified by portents and wonders; but because his experience teaches him that whenever he chooses to bring these convictions into contact with their primary source, Nature — whenever he thinks fit to test them by appealing to experiment and to observation — Nature will confirm them. The man of science has learned to believe in justification, not by faith, but by verification.

Thus, without for a moment pretending to despise the practical results of the improvement of natural knowledge, and its beneficial influence on material civilization, it must, I think, be admitted that the great ideas, some of which I have indicated, and the ethical spirit which I have endeavored to sketch, in the few moments which remained at my disposal, constitute the real and permanent significance of natural knowledge.

If these ideas be destined, as I believe they are, to be more and more firmly established as the world grows older; if that spirit be fated, as I believe it is, to extend itself into all departments of human thought, and to

become co-extensive with the range of knowledge; if, as our race approaches its maturity, it discovers, as I believe it will, that there is but one kind of knowledge and but one method of acquiring it; then we, who are still children, may justly feel it our highest duty to recognize the advisableness of improving natural knowledge, and so to aid ourselves and our successors in our course towards the noble goal which lies before mankind.

XIV

Science and the Applications of Science

By John Tyndall [1]

THIS, then, is the core of the whole matter as regards science. It must be cultivated for its own sake, for the pure love of truth, rather than for the applause or profit that it brings. And now my occupation in America is well-nigh gone. Still I will bespeak your tolerance for a few concluding remarks, in reference to the men who have bequeathed to us the vast body of knowledge of which I have sought to give you some faint idea in these lectures. What was the motive that

1 This selection forms a part of the Conclusion of Tyndall's *Six Lectures on Light* which were delivered in 1872 and 1873 in Boston, New York, Philadelphia, Baltimore, and Washington, and were published in book form in 1873.

John Tyndall, 1820–1893, was one of the best known English scientists and lecturers of his day. He became Professor of Natural Science at the Royal Institution in 1853, and Director after the death of Faraday in 1867. Among his best known books are *Glaciers of the Alps, Heat as a Mode of Motion*, and the volume on light from which this selection is taken. His lectures in America in 1872–3 were extremely popular and gained Tyndall about $13,000: this sum Tyndall left in the hands of trustees for the encouragement of American students of science. His first plan was to have the interest used to maintain two American students constantly through a four years' course at a German university. But in 1885, on the advice of his trustees, this plan was changed, and the money, which by this time had accumulated to about $32,000, was divided equally among Columbia College, Harvard University, and the University of Pennsylvania, to be used for the encouragement of the study of science in those institutions.—EDITOR.

spurred them on? What urged them to those battles and those victories over reticent Nature, which have become the heritage of the human race? It is never to be forgotten that not one of those great investigators, from Aristotle down to Stokes and Kirchhoff, had any practical end in view, according to the ordinary definition of the word "practical." They did not propose to themselves money as an end, and knowledge as a means of obtaining it. For the most part, they nobly reversed this process, made knowledge their end, and such money as they possessed the means of obtaining it.

We see to-day the issues of their work in a thousand practical forms, and this may be thought sufficient to justify, if not ennoble their efforts. But they did not work for such issues; their reward was of a totally different kind. In what way different? We love clothes, we love luxuries, we love fine equipages, we love money, and any man who can point to these as the result of his efforts in life, justifies these results before all the world. In America and England, more especially, he is a "practical" man. But I would appeal confidently to this assembly whether such things exhaust the demands of human nature? The very presence here for six inclement nights of this great audience, embodying so much of the mental force and refinement of this vast city,[1] is an answer to my question. I need not tell such an assembly that there are joys of the intellect as well as joys of the body, or that these pleasures of the spirit constituted the reward

1 New York: for more than a decade no such weather had been experienced. The snow was so deep that the ordinary means of locomotion were for a time suspended.

of our great investigators. Led on by the whisperings of natural truth, through pain and self-denial, they often pursued their work. With the ruling passion strong in death, some of them, when no longer able to hold a pen, dictated to their friends the results of their labors, and then rested from them forever.

Could we have seen these men at work, without any knowledge of the consequences of their work, what should we have thought of them? To the uninitiated, in their day, they might often appear as big children playing with soap-bubbles and other trifles. It is so to this hour. Could you watch the true investigator — your Henry or your Draper, for example — in his laboratory, unless animated by his spirit, you could hardly understand what keeps him there. Many of the objects which rivet his attention might appear to you utterly trivial; and, if you were to ask him what is the *use* of his work, the chances are that you would confound him. He might not be able to express the use of it in intelligible terms. He might not be able to assure you that it will put a dollar into the pocket of any human being, living or to come. That scientific discovery *may* put not only dollars into the pockets of individuals, but millions into the exchequers of nations, the history of science amply proves; but the hope of its doing so never was, and it never can be, the motive power of the investigator.

I know that some risk is run in speaking thus before practical men. I know what De Tocqueville says of you. "The man of the North," he says, "has not only experience, but knowledge. He, however, does not care for science as a pleasure, and only embraces it

with avidity when it leads to useful applications." But what, I would ask, are the hopes of useful applications which have caused you so many times to fill this place, in spite of snow-drifts and biting cold? What, I may ask, is the origin of that kindness which drew me from my work in London to address you here, and which, if I permitted it, would send me home a millionaire? Not because I had taught you to make a single cent by science am I here to-night, but because I tried to the best of my ability to present science to the world as an intellectual good. Surely no two terms were ever so distorted and misapplied with reference to man, in his higher relations, as these terms useful and practical. Let us expand our definitions until they embrace all the needs of man, his highest intellectual needs inclusive. It is specially on this ground of its administering to the higher needs of the intellect; it is mainly because I believe it to be wholesome, not only as a source of knowledge but as a means of discipline, that I urge the claims of science upon your attention.

But with reference to material needs and joys, surely pure science has also a word to say. People sometimes speak as if steam had not been studied before James Watt, or electricity before Wheatstone and Morse; whereas, in point of fact, Watt and Wheatstone and Morse, with all their practicality, were the mere outcome of antecedent forces, which acted without reference to practical ends. This also, I think, merits a moment's attention. You are delighted, and with good reason, with your electric telegraphs, proud of your steam engines and your factories, and charmed with the productions of photography. You see daily, with just elation, the creation of new forms of industry —

new powers of adding to the wealth and comfort of society. Industrial England is heaving with forces tending to this end; and the pulse of industry beats still stronger in the United States. And yet, when analyzed, what are industrial America and industrial England?

If you can tolerate freedom of speech on my part, I will answer this question by an illustration. Strip a strong arm, and regard the knotted muscles when the hand is clenched and the arm bent. Is this exhibition of energy the work of the muscle alone? By no means. The muscle is the channel of an influence, without which it would be as powerless as a lump of plastic dough. It is the delicate unseen nerve that unlocks the power of the muscle. And without those filaments of genius, which have been shot like nerves through the body of society by the original discoverer, industrial America, and industrial England, would be very much in the condition of that plastic dough.

At the present time there is a cry in England for technical education, and it is a cry in which the most commonplace intellect can join, its necessity is so obvious. But there is no cry for original investigation. Still without this, as surely as the stream dwindles when the spring dies, so surely will "technical education" lose all force of growth, all power of reproduction. Our great investigators have given us sufficient work for a time; but if their spirit die out, we shall find ourselves eventually in the condition of those Chinese mentioned by De Tocqueville, who, having forgotten the scientific origin of what they did, were at length compelled to copy without variation the inventions of an ancestry wiser than themselves,

who had drawn their inspiration direct from Nature.

Both England and America have reason to bear those things in mind, for the largeness and nearness of material results are only too likely to cause both countries to forget the small spiritual beginnings of such results, in the mind of the scientific discoverer. You multiply, but he creates. And if you starve him, or otherwise kill him — nay, if you fail to secure for him free scope and encouragement — you not only lose the motive power of intellectual progress, but infallibly sever yourselves from the springs of industrial life.

What has been said of technical operations holds equally good for education, for here also the original investigator constitutes the fountain-head of knowledge. It belongs to the teacher to give this knowledge the requisite form; an honorable and often a difficult task. But it is a task which receives its final sanctification, when the teacher himself honestly tries to add a rill to the great stream of scientific discovery. Indeed, it may be doubted whether the real life of science can be fully felt and communicated by the man who has not himself been taught by direct communion with Nature. We may, it is true, have good and instructive lectures from men of ability, the whole of whose knowledge is second-hand, just as we may have good and instructive sermons from intellectually able and unregenerate men. But for that power of science, which corresponds to what the Puritan fathers would call experimental religion in the heart, you must ascend to the original investigator.

To keep society as regards science in healthy play, three classes of workers are necessary: Firstly, the investigator of natural truth, whose vocation it is to

pursue that truth, and extend the field of discovery for the truth's own sake, and without reference to practical ends. Secondly, the teacher of natural truth, whose vocation it is to give public diffusion to the knowledge already won by the discoverer. Thirdly, the applier of natural truth, whose vocation it is to make scientific knowledge available for the needs, comforts, and luxuries of civilized life. These three classes ought to coexist and interact. Now, the popular notion of science, both in this country and in England, often relates not to science strictly so called, but to the applications of science. Such applications, especially on this continent, are so astounding — they spread themselves so largely and umbrageously before the public eye — that they often shut out from view those workers who are engaged in the quieter and profounder business of original investigation.

Take the electric telegraph as an example, which has been repeatedly forced upon my attention of late. I am not here to attenuate in the slightest degree the services of those who, in England and America, have given the telegraph a form so wonderfully fitted for public use. They earned a great reward, and they have received it. But I should be untrue to you and to myself if I failed to tell you that, however high in particular respects their claims and qualities may be, your practical men did not discover the electric telegraph. The discovery of the electric telegraph implies the discovery of electricity itself, and the development of its laws and phenomena. Such discoveries are not made by practical men, and they never will be made by them, because their minds are beset by ideas which, though of the highest value from one point of

view, are not those which stimulate the original discoverer.

The ancients discovered the electricity of amber; and Gilbert, in the year 1600, extended the discovery to other bodies. Then followed Boyle, Von Guericke, Gray, Canton, Du Fay, Kleist, Cunæus, and your own Franklin. But their form of electricity, though tried, did not come into use for telegraphic purposes. Then appeared the great Italian Volta, who discovered the source of electricity which bears his name, and applied the most profound insight, and the most delicate experimental skill, to its development. Then arose the man who added to the powers of his intellect all the graces of the human heart, Michael Faraday, the discoverer of the great domain of magneto-electricity. Œrsted discovered the deflection of the magnetic needle, and Arago and Sturgeon the magnetization of iron by the electric current. The voltaic circuit finally found its theoretic Newton in Ohm; while Henry, of Princeton, who had the sagacity to recognise the merits of Ohm while they were still decried in his own country, was at this time in the van of experimental inquiry.

In the works of these men you have all the materials employed at this hour, in all the forms of the electric telegraph. Nay, more; Gauss, the celebrated astronomer, and Weber, the celebrated natural philosopher, both professors in the University of Göttingen, wishing to establish a rapid mode of communication between the observatory and the physical cabinet of the university, did this by means of an electric telegraph. Thus, before your practical men appeared upon the scene, the force had been discovered, its laws investigated and made sure, the most complete mastery

of its phenomena had been attained — nay, its applicability to telegraphic purposes demonstrated — by men whose sole reward for their labors was the noble excitement of research, and the joy attendant on the discovery of natural truth.

Are we to ignore all this? We do so at our peril. For I say again that, behind all our practical applications, there is a region of intellectual action to which practical men have rarely contributed, but from which they draw all their supplies. Cut them off from this region, and they become eventually helpless. In no case is the adage truer, "Other men labored, but ye are entered into their labors," than in the case of the discoverer and applier of natural truth. But now a word on the other side. While practical men are not the men to make the necessary antecedent discoveries, the cases are rare, though, in our day, not absent, in which the discoverer knows how to turn his labors to practical account. Different qualities of mind and habits of thought are usually needed in the two cases; and while I wish to give emphatic utterance to the claims of those whose position, owing to the simple fact of their intellectual elevation, is often misunderstood, I am not here to exalt the one class of workers at the expense of the other. They are the necessary complements of each other. But remember that one class is sure to be taken care of. All the material rewards of society are already within their reach, while that same society habitually ascribes to them intellectual achievements which were never theirs. This cannot but act to the detriment of those studies out of which, not only our knowledge of nature, but our present industrial arts themselves have sprung, and from

which the rising genius of the country is incessantly tempted away.

Pasteur, one of the most eminent members of the Institute of France, in accounting for the disastrous overthrow of his country and the predominance of Germany in the late war, expresses himself thus: "Few persons comprehend the real origin of the marvels of industry and the wealth of nations. I need no further proof of this than the employment more and more frequent in official language, and in writing of all sorts, of the erroneous expression *applied science*. The abandonment of scientific careers by men capable of pursuing them with distinction, was recently deplored in the presence of a minister of the greatest talent. The statesman endeavored to show that we ought not to be surprised at this result, because *in our day the reign of theoretic science yielded place to that of applied science*. Nothing could be more erroneous than this opinion, nothing, I venture to say, more dangerous, even to practical life, than the consequences which might flow from these words. They have rested in my mind as a proof of the imperious necessity of reform in our superior education. There exists no category of the sciences, to which the name of applied science could be rightly given. *We have science, and the applications of science,* which are united together as the tree and its fruit."

And Cuvier, the great comparative anatomist, writes thus upon the same theme: "These grand practical innovations are the mere applications of truths of a higher order, not sought with a practical intent, but pursued for their own sake, and solely through an ardor for knowledge. Those who applied them could

not have discovered them; those who discovered them had no inclination to pursue them to a practical end. Engaged in the high regions whither their thoughts had carried them, they hardly perceived these practical issues, though born of their own deeds. These rising workshops, these peopled colonies, those ships which furrow the seas—this abundance, this luxury, this tumult — all this comes from discoverers in science, and it all remains strange to them. At the point where science merges into practice they abandon it; it concerns them no more."

When the Pilgrim Fathers landed at Plymouth Rock, and when Penn made his treaty with the Indians, the new-comers had to build their houses, to chasten the earth into cultivation, and to take care of their souls. In such a community science, in its more abstract forms, was not to be thought of. And at the present hour, when your hardy Western pioneers stand face to face with stubborn Nature, piercing the mountains and subduing the forest and the prairie, the pursuit of science, for its own sake, is not to be expected. The first need of man is food and shelter; but a vast portion of this continent is already raised far beyond this need. The gentlemen of New York, Brooklyn, Boston, Philadelphia, Baltimore, and Washington, have already built their houses, and very beautiful they are: they have also secured their dinners, to the excellence of which I can also bear testimony. They have, in fact, reached that precise condition of well-being and independence when a culture, as high as humanity has yet reached, may be justly demanded at their hands. They have reached that maturity, as possessors of wealth and leisure, when the investiga-

tor of natural truth, for the truth's own sake, ought to find among them promoters and protectors.

Among the many problems before them they have this to solve, whether a republic is able to foster the highest forms of genius. You are familiar with the writings of De Tocqueville, and must be aware of the intense sympathy which he felt for your institutions; and this sympathy is all the more valuable from the philosophic candor with which he points not only your merits, but your defects and dangers. Now if I come here to speak of science in America in a critical and captious spirit, an invisible radiation from my words and manner will enable you to find me out, and will guide your treatment of me to-night. But if I in no unfriendly spirit — in a spirit, indeed, the reverse of unfriendly — venture to repeat before you what this great historian and analyst of democratic institutions said of America, I am persuaded that you will hear me out. He wrote some three and twenty years ago, and, perhaps, would not write the same to-day; but it will do nobody any harm to have his words repeated, and, if necessary, laid to heart.

In a work published in 1850, De Tocqueville says: "It must be confessed that, among the civilized peoples of our age, there are few in which the highest sciences have made so little progress as in the United States." [1] He declares his conviction that, had you been alone in the universe, you would soon have discovered that you cannot long make progress in practical science, without cultivating theoretic science at the same time. But, according to De Tocqueville, you are not thus alone.

1 "De la Démocratie en Amérique, etc.," tome ii. p. 36. [The French passage, quoted by Tyndall, is here omitted.— EDITOR.]

He refuses to separate America from its ancestral home; and it is there, he contends, that you collect the treasures of the intellect, without taking the trouble to create them.

De Tocqueville evidently doubts the capacity of a democracy to foster genius as it was fostered in the ancient aristocracies. "The future," he says, "will prove whether the passion for profound knowledge, so rare and so fruitful, can be born and developed so readily in democratic societies as in aristocracies. As for me," he continues, "I can hardly believe it." He speaks of the unquiet feverishness of democratic communities, not in times of great excitement, for such times may give an extraordinary impetus to ideas, but in times of peace. There is then, he says, "a small and uncomfortable agitation, a sort of incessant attrition of man against man, which troubles and distracts the mind without imparting to it either loftiness or animation." It rests with you to prove whether these things are necessarily so — whether scientific genius cannot find, in the midst of you, a tranquil home.

I should be loth to gainsay so keen an observer and so profound a political writer, but, since my arrival in this country, I have been unable to see anything in the constitution of society, to prevent a student, with the root of the matter in him, from bestowing the most steadfast devotion on pure science. If great scientific results are not achieved in America, it is not to the small agitations of society that I should be disposed to ascribe the defect, but to the fact that the men among you who possess the endowments necessary for profound scientific inquiry, are laden with duties of administration, or tuition, so heavy as to be utterly

incompatible with the continuous and tranquil meditation which original investigation demands. It may well be asked whether Henry would have been transformed into an administrator, or whether Draper would have forsaken science to write history, if the original investigator had been honored as he ought to be in this land. I hardly think they would. Still I do not imagine this state of things likely to last. In America there is a willingness on the part of individuals to devote their fortunes, in the matter of education, to the service of the commonwealth, which is probably without a parallel elsewhere: and this willingness requires but wise direction to enable you effectually to wipe away the reproach of De Tocqueville.

Your most difficult problem will be not to build institutions, but to discover men. You may erect laboratories and endow them; you may furnish them with all the appliances needed for enquiry; in so doing you are but creating opportunity for the exercise of powers which come from sources entirely beyond your reach. You cannot create genius by bidding for it. In biblical language, it is the gift of God; and the most you could do, were your wealth, and your willingness to apply it, a million-fold what they are, would be to make sure that this glorious plant shall have the freedom, light, and warmth necessary for its development. We see from time to time a noble tree dragged down by parasitic runners. These the gardener can remove, though the vital force of the tree itself may lie beyond him: and so, in many a case, you men of wealth can liberate genius from the hampering toils which the struggle for existence often casts around it.

Drawn by your kindness, I have come here to give these lectures, and now that my visit to America has become almost a thing of the past, I look back upon it as a memory without a single stain. No lecturer was ever rewarded as I have been. From this vantage-ground, however, let me remind you that the work of the lecturer is not the highest work; that, in science, the lecturer is usually the distributor of intellectual wealth amassed by better men. And though lecturing and teaching, in moderation, will in general promote their moral health, it is not solely, or even chiefly, as lecturers, but as investigators, that your highest men ought to be employed. You have scientific genius amongst you — not sown broadcast, believe me, it is sown thus nowhere — but still scattered here and there. Take all unnecessary impediments out of its way. Keep your sympathetic eye upon the originator of knowledge. Give him the freedom necessary for his researches, not overloading him, either with the duties of tuition or of administration, not demanding from him so-called practical results — above all things, avoiding that question which ignorance so often addresses to genius, "What is the use of your work?" Let him make truth his object, however unpractical for the time being it may appear. If you cast your bread thus upon the waters, then be assured it will return to you, though it may be after many days.

XV

Literature

By John Henry Newman [1]

WISHING to address you, Gentlemen, at the commencement of a new Session, I tried to find a subject for discussion, which might be at once suitable to the occasion, yet neither too large for your time, nor too minute or abtruse for your attention. I think I see one for my purpose in the very title of your Faculty. It is the Faculty of Philosophy and Letters. Now the question may arise as to what is meant by "Philosophy," and what is meant by "Letters." As to the other Faculties, the subject-matter which they profess is intelligible, as soon as named, and beyond all dispute. We know what Science is, what Medicine, what Law,

1 This discourse was the second in Newman's *Lectures and Essays on University Subjects,* published in 1859 and reprinted in 1873 as the second part of his *Idea of a University.* The lectures were delivered at the Catholic University of Dublin, of which Newman was Rector from 1854 to 1858. This one is described by Newman as "A Lecture in the School of Philosophy and Letters."

John Henry Newman, 1801–1890, was from 1822 to 1845 a Fellow of Oriel College, Oxford; he was one of the leaders of the Oxford Movement and an influential writer on Anglican theology. In 1845 came the crisis of his life: his researches into the theology of the Church of England left him with the conviction that her position was untenable, and in this year he became a member of the Roman Catholic Church. He published in 1864 his famous *Apologia pro Vita Sua* in reply to Charles Kingsley's attack upon his good faith. In 1879 he was made Cardinal. Although Newman is perhaps best known for his writing on theological questions, his connection with the ill-starred Catholic University of Dublin has left a few discourses on education which are a part of his finest work.— EDITOR.

and what Theology; but we have not so much ease in determining what is meant by Philosophy and Letters. Each department of that twofold province needs explanation: it will be sufficient, on an occasion like this, to investigate one of them. Accordingly I shall select for remark the latter of the two, and attempt to determine what we are to understand by Letters or Literature, in what Literature consists, and how it stands relatively to Science.

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Here, then, in the first place, I observe, Gentlemen, that Literature, from the derivation of the word, implies writing, not speaking; this, however, arises from the circumstance of the copiousness, variety, and public circulation of the matters of which it consists. What is spoken cannot outrun the range of the speaker's voice, and perishes in the uttering. When words are in demand to express a long course of thought, when they have to be conveyed to the ends of the earth, or perpetuated for the benefit of posterity, they must be written down, that is, reduced to the shape of literature; still, properly speaking, the terms, by which we denote this characteristic gift of man, belong to its exhibition by means of the voice, not of handwriting. It addresses itself, in its primary idea, to the ear, not to the eye. We call it the power of speech, we call it language, that is, the use of the tongue; and, even when we write, we still keep in mind what was its original instrument, for we use freely such terms in our books as "saying," "speaking," "telling," "talking," "calling"; we use the terms "phraseology" and "diction"; as if we were still addressing ourselves to the ear.

Now I insist on this, because it shows that speech, and therefore literature, which is its permanent record, is essentially a personal work. It is not some production or result, attained by the partnership of several persons, or by machinery, or by any natural process, but in its very idea it proceeds, and must proceed, from some one given individual. Two persons cannot be the authors of the sounds which strike our ear; and, as they cannot be speaking one and the same speech, neither can they be writing one and the same lecture or discourse,— which must certainly belong to some one person or other, and is the expression of that one person's ideas and feelings,— ideas and feelings personal to himself, though others may have parallel and similar ones,— proper to himself, in the same sense as his voice, his air, his countenance, his carriage, and his action, are personal. In other words, Literature expresses, not objective truth, as it is called, but subjective; not things, but thoughts.

Now this doctrine will become clearer by considering another use of words, which does relate to objective truth, or to things; which relates to matters, not personal, not subjective to the individual, but which, even were there no individual man in the whole world to know them or to talk about them, would exist still. Such objects become the matter of Science, and words indeed are used to express them, but such words are rather symbols than language, and however many we use, and however we may perpetuate them by writing, we never could make any kind of literature out of them, or call them by that name. Such, for instance, would be Euclid's Elements; they relate to truths universal and eternal; they are not mere thoughts,

but things: they exist in themselves, not by virtue of our understanding them, not in dependence upon our will, but in what is called the *nature* of things, or at least on conditions external to us. The words, then, in which they are set forth are not language, speech, literature, but rather, as I have said, symbols. And, as a proof of it, you will recollect that it is possible, nay usual, to set forth the propositions of Euclid in algebraical notation, which, as all would admit, has nothing to do with literature. What is true of mathematics is true also of every study, so far forth as it is scientific; it makes use of words as the mere vehicle of things, and is thereby withdrawn from the province of literature. Thus metaphysics, ethics, law, political economy, chemistry, theology, cease to be literature in the same degree as they are capable of a severe scientific treatment. And hence it is that Aristotle's works on the one hand, though at first sight literature, approach in character, at least a great number of them, to mere science; for even though the things which he treats of and exhibits may not always be real and true, yet he treats them as if they were, not as if they were the thoughts of his own mind; that is, he treats them scientifically. On the other hand, Law or Natural History has before now been treated by an author with so much of coloring derived from his own mind as to become a sort of literature; this is especially seen in the instance of Theology, when it takes the shape of Pulpit Eloquence. It is seen too in historical composition, which becomes a mere specimen of chronology, or a chronicle, when divested of the philosophy, the skill, or the party and personal feelings of the particular writer. Science, then, has to do with things,

literature with thoughts; science is universal, literature is personal; science uses words merely as symbols, but literature uses language in its full compass, as including phraseology, idiom, style, composition, rhythm, eloquence, and whatever other properties are included in it.

Let us then put aside the scientific use of words, when we are to speak of language and literature. Literature is the personal use or exercise of language. That this is so is further proved from the fact that one author uses it so differently from another. Language itself in its very origination would seem to be traceable to individuals. Their peculiarities have given it its character. We are often able in fact to trace particular phrases or idioms to individuals; we know the history of their rise. Slang surely, as it is called, comes of, and breathes of the personal. The connection between the force of words in particular languages and the habits and sentiments of the nations speaking them has often been pointed out. And, while the many use language as they find it, the man of genius uses it indeed, but subjects it withal to his own purposes, and moulds it according to his own peculiarities. The throng and succession of ideas, thoughts, feelings, imaginations, aspirations, which pass within him, the abstractions, the juxtapositions, the comparisons, the discriminations, the conceptions, which are so original in him, his views of external things, his judgments upon life, manners, and history, the exercises of his wit, of his humor, of his depth, of his sagacity, all these innumerable and incessant creations, the very pulsation and throbbing of his intellect, does he image forth, to all does he give utterance, in a cor-

responding language, which is as multiform as this inward mental action itself and analogous to it, the faithful expression of his intense personality, attending on his own inward world of thought as its very shadow: so that we might as well say that one man's shadow is another's as that the style of a really gifted mind can belong to any but himself. It follows him about *as* a shadow. His thought and feeling are personal, and so his language is personal.

Thought and speech are inseparable from each other. Matter and expression are parts of one: style is a thinking out into language. This is what I have been laying down, and this is literature; not *things,* not the verbal symbols of things; not on the other hand mere *words;* but thoughts expressed in language. Call to mind, Gentlemen, the meaning of the Greek word which expresses this special prerogative of man over the feeble intelligence of the inferior animals. It is called Logos: what does Logos mean? it stands both for *reason* and for *speech,* and it is difficult to say which it means more properly. It means both at once: why? because really they cannot be divided,— because they are in a true sense one. When we can separate light and illumination, life and motion, the convex and the concave of a curve, then will it be possible for thought to tread speech under foot, and to hope to do without it — then will it be conceivable that the vigorous and fertile intellect should renounce its own double, its instrument of expression, and the channel of its speculations and emotions.

Critics should consider this view of the subject before they lay down such canons of taste as the writer

whose pages I have quoted.[1] Such men as he is consider fine writing to be an *addition from without* to the matter treated of,— a sort of ornament superinduced, or a luxury indulged in, by those who have time and inclination for such vanities. They speak as if *one* man could do the thought, and *another* the style. We read in Persian travels of the way in which young gentlemen go to work in the East, when they would engage in correspondence with those who inspire them with hope or fear. They cannot write one sentence themselves; so they betake themselves to the professional letter-writer. They confide to him the object they have in view. They have a point to gain from a superior, a favor to ask, an evil to deprecate; they have to approach a man in power, or to make court to some beautiful lady. The professional man manufactures words for them, as they are wanted, as a stationer sells them paper, or a schoolmaster might cut their pens. Thought and word are, in their conception, two things, and thus there is a division of labor. The man of thought comes to the man of words; and the man of words, duly instructed in the thought, dips the pen of desire into the ink of devotedness, and proceeds to spread it over the page of desolation. Then the nightingale of affection is heard to warble to the rose of loveliness, while the breeze of anxiety plays around the brow of expectation. This is what the Easterns are said to consider fine writing; and it seems pretty much the idea of the school of critics to whom I have been referring.

1 The reference is to a passage from Sterne's *Sermons* quoted by Newman earlier in the lecture, but here omitted. The context makes the point to the omitted passage sufficiently clear.— EDITOR.

We have an instance in literary history of this very proceeding nearer home, in a great University, in the latter years of the last century. I have referred to it before now in a public lecture elsewhere;[1] but it is too much in point here to be omitted. A learned Arabic scholar had to deliver a set of lectures before its doctors and professors on an historical subject in which his reading had lain. A linguist is conversant with science rather than with literature; but this gentleman felt that his lectures must not be without a style. Being of the opinion of the Orientals, with whose writings he was familiar, he determined to buy a style. He took the step of engaging a person, at a price, to turn the matter which he had got together into ornamental English. Observe, he did not wish for mere grammatical English, but for an elaborate, pretentious style. An artist was found in the person of a country curate, and the job was carried out. His lectures remain to this day, in their own place in the protracted series of annual Discourses to which they belong, distinguished amid a number of heavyish compositions by the rhetorical and ambitious diction for which he went into the market. This learned divine, indeed, and the author I have quoted, differ from each other in the estimate they respectively form of literary composition; but they agree together in this,—in considering such composition a trick and a trade; they put it on a par with the gold plate and the flowers and the music of a banquet, which do not make the viands better, but the entertainment more pleasurable; as if language were the hired servant, the mere mis-

1 "Position of Catholics in England," pp. 101–2.

tress of the reason, and not the lawful wife in her own house.

But can they really think that Homer, or Pindar, or Shakespeare, or Dryden, or Walter Scott, were accustomed to aim at diction for its own sake, instead of being inspired with their subject, and pouring forth beautiful words because they had beautiful thoughts? this is surely too great a paradox to be borne. Rather, it is the fire within the author's breast which overflows in the torrent of his burning, irresistible eloquence; it is the poetry of his inner soul, which relieves itself in the Ode or the Elegy; and his mental attitude and bearing, the beauty of his moral countenance, the force and keenness of his logic, are imaged in the tenderness, or energy, or richness of his language. Nay, according to the well-known line, "facit indignatio *versus;*" not the words alone, but even the rhythm, the metre, the verse, will be the contemporaneous offspring of the emotion or imagination which possesses him. "Poeta nascitur, non fit," says the proverb; and this is in numerous instances true of his poems, as well as of himself. They are born, not framed; they are a strain rather than a composition; and their perfection is the monument, not so much of his skill as of his power. And this is true of prose as well as of verse in its degree: who will not recognize in the vision of Mirza a delicacy and beauty of style which is very difficult to describe, but which is felt to be in exact correspondence to the ideas of which it is the expression?

And, since the thoughts and reasonings of an author have, as I have said, a personal character, no wonder that his style is not only the image of his subject, but

of his mind. That pomp of language, that full and tuneful diction, that felicitousness in the choice and exquisiteness in the collocation of words, which to prosaic writers seem artificial, is nothing else but the mere habit and way of a lofty intellect. Aristotle, in his sketch of the magnanimous man, tells us that his voice is deep, his motions slow, and his stature commanding. In like manner, the elocution of a great intellect is great. His language expresses, not only his great thoughts, but his great self. Certainly he might use fewer words than he uses; but he fertilizes his simplest ideas, and germinates into a multitude of details, and prolongs the march of his sentences, and sweeps round to the full diapason of his harmony, as if κύδεϊ γαίων, rejoicing in his own vigor and richness of resource. I say, a narrow critic will call it verbiage, when really it is a sort of fulness of heart, parallel to that which makes the merry boy whistle as he walks, or the strong man, like the smith in the novel, flourish his club when there is no one to fight with.

Shakespeare furnishes us with frequent instances of this peculiarity, and all so beautiful, that it is difficult to select for quotation. For instance, in Macbeth:—

> "Canst thou not minister to a mind diseased,
> Pluck from the memory a rooted sorrow,
> Raze out the written troubles of the brain,
> And, with some sweet oblivious antidote,
> Cleanse the foul bosom of that perilous stuff,
> Which weighs upon the heart?"

Here a simple idea, by a process which belongs to the orator rather than to the poet, but still comes from the native vigor of genius, is expanded into a many-membered period.

The following from Hamlet is of the same kind: —

> "'Tis not alone my inky cloak, good mother,
> Nor customary suits of solemn black,
> Nor windy suspiration of forced breath,
> No, nor the fruitful river in the eye,
> Nor the dejected haviour of the visage,
> Together with all forms, modes, shows of grief,
> That can denote me truly."

Now, if such declamation, for declamation it is, however noble, be allowable in a poet, whose genius is so far removed from pompousness or pretence, much more is it allowable in an orator, whose very province it is to put forth words to the best advantage he can. Cicero has nothing more redundant in any part of his writings than these passages from Shakespeare. No lover then at least of Shakespeare may fairly accuse Cicero of gorgeousness of phraseology or diffuseness of style. Nor will any sound critic be tempted to do so. As a certain unaffected neatness and propriety and grace of diction may be required of any author who lays claim to be a classic, for the same reason that a certain attention to dress is expected of every gentleman, so to Cicero may be allowed the privilege of the "os magna sonaturum," of which the ancient critic speaks. His copious, majestic, musical flow of language, even if sometimes beyond what the subject-matter demands, is never out of keeping with the occasion or with the speaker. It is the expression of lofty sentiments in lofty sentences, the "mens magna in corpore magno." It is the development of the inner man. Cicero vividly realized the *status* of a Roman senator and statesman, and the "pride of place" of Rome, in all the grace and grandeur which attached to her; and he imbibed, and be-

came, what he admired. As the exploits of Scipio or Pompey are the expression of this greatness in deed, so the language of Cicero is the expression of it in word. And, as the acts of the Roman ruler or soldier represent to us, in a manner special to themselves, the characteristic magnanimity of the lords of the earth, so do the speeches or treatises of her accomplished orator bring it home to our imaginations as no other writing could do. Neither Livy, nor Tacitus, nor Terence, nor Seneca, nor Pliny, nor Quintilian, is an adequate spokesman for the Imperial City. They write Latin; Cicero writes Roman.

You will say that Cicero's language is undeniably studied, but that Shakespeare's is as undeniably natural and spontaneous; and that this is what is meant, when the Classics are accused of being mere artists of words. Here we are introduced to a further large question, which gives me the opportunity of anticipating a misapprehension of my meaning. I observe, then, that, not only is that lavish richness of style, which I have noticed in Shakespeare, justifiable on the principles which I have been laying down, but, what is less easy to receive, even elaborateness in composition is no mark of trick or artifice in an author. Undoubtedly the works of the Classics, particularly the Latin, *are* elaborate; they have cost a great deal of time, care, and trouble. They have had many rough copies; I grant it. I grant also that there are writers of name, ancient and modern, who really are guilty of the absurdity of making sentences, as the very end of their literary labor. Such was Isocrates; such were some of the sophists; they were set on words, to the neglect of thoughts or

things; I cannot defend them. If I must give an English instance of this fault, much as I love and revere the personal character and intellectual vigor of Dr. Johnson, I cannot deny that his style often outruns the sense and the occasion, and is wanting in that simplicity which is the attribute of genius. Still, granting all this, I cannot grant, notwithstanding, that genius never need take pains,— that genius may not improve by practice,— that it never incurs failures, and succeeds the second time,— that it never finishes off at leisure what it has thrown off in the outline at a stroke.

Take the instance of the painter or the sculptor; he has a conception in his mind which he wishes to represent in the medium of his art; — the Madonna and Child, or Innocence, or Fortitude, or some historical character or event. Do you mean to say he does not study his subject? does he not make sketches? does he not even call them "studies"? does he not call his workroom a *studio?* is he not ever designing, rejecting, adopting, correcting, perfecting? Are not the first attempts of Michael Angelo and Raffaelle extant, in the case of some of their most celebrated compositions? Will any one say that the Apollo Belvedere is not a conception patiently elaborated into its proper perfection? These departments of taste are, according to the received notions of the world, the very province of genius, and yet we call them *arts;* they are the "Fine Arts." Why may not that be true of literary composition which is true of painting, sculpture, architecture, and music? Why may not language be wrought as well as the clay of the modeller? why may not words be worked up as well as colors? why should not skill in diction be simply subservient and instrumental to the

great prototypal ideas which are the contemplation of a Plato or a Virgil? Our greatest poet tells us,

> "The poet's eye, in a fine frenzy rolling,
> Doth glance from heaven to earth, from earth to heaven,
> And, as imagination bodies forth
> The forms of things unknown, the poet's pen
> Turns them to shapes, and gives to airy nothing
> A local habitation and a name."

Now, is it wonderful that that pen of his should sometimes be at fault for a while,— that it should pause, write, erase, re-write, amend, complete, before he satisfies himself that his language has done justice to the conceptions which his mind's eye contemplated?

In this point of view, doubtless, many or most writers are elaborate; and those certainly not the least whose style is furthest removed from ornament, being simple and natural, or vehement, or severely business-like and practical. Who so energetic and manly as Demosthenes? Yet he is said to have transcribed Thucydides many times over in the formation of his style. Who so gracefully natural as Herodotus? yet his very dialect is not his own, but chosen for the sake of the perfection of his narrative. Who exhibits such happy negligence as our own Addison? yet artistic fastidiousness was so notorious in his instance that the report has got abroad, truly or not, that he was too late in his issue of an important state-paper, from his habit of revision and recomposition. Such great authors were working by a model which was before the eyes of their intellect, and they were laboring to say what they had to say, in such a way as would most exactly and suitably express it. It is not wonderful that other authors, whose style is not simple, should be instances of a similar literary

diligence. Virgil wished his Æneid to be burned, elaborate as is its composition, because he felt it needed more labor still, in order to make it perfect. The historian Gibbon in the last century is another instance in point. You must not suppose I am going to recommend his style for imitation, any more than his principles; but I refer to him as the example of a writer feeling the task which lay before him, feeling that he had to bring out into words for the comprehension of his readers a great and complicated scene, and wishing that those words should be adequate to his undertaking. I think he wrote the first chapter of his History three times over; it was not that he corrected or improved the first copy; but he put his first essay, and then his second, aside — he recast his matter, till he had hit the precise exhibition of it which he thought demanded by his subject.

Now in all these instances, I wish you to observe, that what I have admitted about literary workmanship differs from the doctrine which I am opposing in this, — that the mere dealer in words cares little or nothing for the subject which he is embellishing, but can paint and gild anything whatever to order; whereas the artist, whom I am acknowledging, has his great or rich visions before him, and his only aim is to bring out what he thinks or what he feels in a way adequate to the thing spoken of, and appropriate to the speaker.

The illustration which I have been borrowing from the Fine Arts will enable me to go a step further. I have been showing the connection of the thought with the language in literary composition; and in doing so I have exposed the unphilosophical notion, that the

language was an extra which could be dispensed with, and provided to order according to the demand. But I have not yet brought out, what immediately follows from this, and which was the second point which I had to show, viz., that to be capable of easy translation is no test of the excellence of a composition. If I must say what I think, I should lay down, with little hesitation, that the truth was almost the reverse of this doctrine. Nor are many words required to show it. Such a doctrine, as is contained in the passage of the author whom I quoted when I began, goes upon the assumption that one language is just like another language,— that every language has all the ideas, turns of thought, delicacies of expression, figures, associations, abstractions, points of view, which every other language has. Now, as far as regards Science, it is true that all languages are pretty much alike for the purposes of Science; but even in this respect some are more suitable than others, which have to coin words, or to borrow them, in order to express scientific ideas. But if languages are not all equally adapted even to furnish symbols for those universal and eternal truths in which Science consists, how can they reasonably be expected to be all equally rich, equally forcible, equally musical, equally exact, equally happy in expressing the idiosyncratic peculiarities of thought of some original and fertile mind, who has availed himself of one of them? A great author takes his native language, masters it, partly throws himself into it, partly moulds and adapts it, and pours out his multitude of ideas through the variously ramified and delicately minute channels of expression which he has found or framed: — does it follow that this his personal presence (as it

may be called) can forthwith be transferred to every other language under the sun? Then may we reasonably maintain that Beethoven's *piano* music is not really beautiful, because it cannot be played on the hurdy-gurdy. Were not this astonishing doctrine maintained by persons far superior to the writer whom I have selected for animadversion, I should find it difficult to be patient under a gratuitous extravagance. It seems that a really great author must admit of translation, and that we have a test of his excellence when he reads to advantage in a foreign language as well as in his own. Then Shakespeare *is* a genius because he can be translated into German, and *not* a genius because he cannot be translated into French. Then the multiplication-table is the most gifted of all conceivable compositions, because it loses nothing by translation, and can hardly be said to belong to any one language whatever. Whereas I should rather have conceived that, in proportion as ideas are novel and recondite, they would be difficult to put into words, and that the very fact of their having insinuated themselves into one language would diminish the chance of that happy accident being repeated in another. In the language of savages you can hardly express any idea or act of the intellect at all: is the tongue of the Hottentot or Esquimaux to be made the measure of the genius of Plato, Pindar, Tacitus, St. Jerome, Dante, or Cervantes?

Let us recur, I say, to the illustration of the Fine Arts. I suppose you can express ideas in painting which you cannot express in sculpture; and the more an artist is of a painter, the less he is likely to be of a sculptor. The more he commits his genius to the

methods and conditions of his own art, the less he will be able to throw himself into the circumstances of another. Is the genius of Fra Angelico, of Francia, or of Raffaelle disparaged by the fact that he was able to do that in colors which no man that ever lived, which no Angel, could achieve in wood? Each of the Fine Arts has its own subject-matter; from the nature of the case you can do in one what you cannot do in another; you can do in painting what you cannot do in carving; you can do in oils what you cannot do in fresco; you can do in marble what you cannot do in ivory; you can do in wax what you cannot do in bronze. Then, I repeat, applying this to the case of languages, why should not genius be able to do in Greek what it cannot do in Latin? and why are its Greek and Latin works defective because they will not turn into English? That genius, of which we are speaking, did not make English; it did not make all languages, present, past, and future; it did not make the laws of *any* language: why is it to be judged of by that in which it had no part, over which it has no control?

. . . . . .

I shall then merely sum up what I have said, and come to a conclusion. Reverting, then, to my original question, what is the meaning of Letters, as contained, Gentlemen, in the designation of your Faculty, I have answered, that by Letters or Literature is meant the expression of thought in language, where by "thought" I mean the ideas, feelings, views, reasonings, and other operations of the human mind. And the Art of Letters is the method by which a speaker or writer brings out in words, worthy of his subject, and sufficient for his audience or readers, the thoughts which impress him.

Literature, then, is of a personal character; it consists in the enunciations and teachings of those who have a right to speak as representatives of their kind, and in whose words their brethren find an interpretation of their own sentiments, a record of their own experience, and a suggestion for their own judgments. A great author, Gentlemen, is not one who merely has a *copia verborum,* whether in prose or verse, and can, as it were, turn on at his will any number of splendid phrases and swelling sentences; but he is one who has something to say and knows how to say it. I do not claim for him, as such, any great depth of thought, or breadth of view, or philosophy, or sagacity, or knowledge of human nature, or experience of human life, though these additional gifts he may have, and the more he has of them the greater he is; but I ascribe to him, as his characteristic gift, in a large sense the faculty of Expression. He is master of the twofold Logos, the thought and the word, distinct, but inseparable from each other. He may, if so be, elaborate his compositions, or he may pour out his improvisations, but in either case he has but one aim, which he keeps steadily before him, and is conscientious and single-minded in fulfilling. That aim is to give forth what he has within him; and from his very earnestness it comes to pass that, whatever be the splendor of his diction or the harmony of his periods, he has with him the charm of an incommunicable simplicity. Whatever be his subject, high or low, he treats it suitably and for its own sake. If he is a poet, "nil molitur *ineptè.*" If he is an orator, then too he speaks, not only "distinctè" and "splendidè," but also "*aptè.*" His page is the lucid mirror of his mind and life —

"Quo fit, ut omnis
Votivâ pateat veluti descripta tabellâ
Vita senis."

He writes passionately, because he feels keenly; forcibly, because he conceives vividly; he sees too clearly to be vague; he is too serious to be otiose; he can analyze his subject, and therefore he is rich; he embraces it as a whole and in its parts, and therefore he is consistent; he has a firm hold of it, and therefore he is luminous. When his imagination wells up, it overflows in ornament; when his heart is touched, it thrills along his verse. He always has the right word for the right idea, and never a word too much. If he is brief, it is because few words suffice; when he is lavish of them, still each word has its mark, and aids, not embarrasses, the vigorous march of his elocution. He expresses what all feel, but all cannot say; and his sayings pass into proverbs among his people, and his phrases become household words and idioms of their daily speech, which is tesselated with the rich fragments of his language, as we see in foreign lands the marbles of Roman grandeur worked into the walls and pavements of modern palaces.

Such pre-eminently is Shakespeare among ourselves; such pre-eminently Virgil among the Latins; such in their degree are all those writers who in every nation go by the name of Classics. To particular nations they are necessarily attached from the circumstance of the variety of tongues, and the peculiarities of each; but so far they have a catholic and ecumenical character, that what they express is common to the whole race of man, and they alone are able to express it.

If then the power of speech is a gift as great as any that can be named, — if the origin of language is by many philosophers even considered to be nothing short of divine, — if by means of words the secrets of the heart are brought to light, pain of soul is relieved, hidden grief is carried off, sympathy conveyed, counsel imparted, experience recorded, and wisdom perpetuated, — if by great authors the many are drawn up into unity, national character is fixed, a people speaks, the past and the future, the East and the West are brought into communication with each other, — if such men are, in a word, the spokesmen and prophets of the human family, — it will not answer to make light of Literature or to neglect its study; rather we may be sure that, in proportion as we master it in whatever language, and imbibe its spirit, we shall ourselves become in our own measure the ministers of like benefits to others, be they many or few, be they in the obscurer or the more distinguished walks of life, — who are united to us by social ties, and are within the sphere of our personal influence.

XVI

Science and Culture

By Thomas Henry Huxley [1]

Six years ago, as some of my present hearers may remember, I had the privilege of addressing a large assemblage of the inhabitants of this city, who had gathered together to do honor to the memory of their famous townsman, Joseph Priestley; and, if any satisfaction attaches to posthumous glory, we may hope that the manes of the burnt-out philosopher were then finally appeased.

No man, however, who is endowed with a fair share of common-sense, and not more than a fair share of vanity, will identify either contemporary or posthumous fame with the highest good; and Priestley's life leaves no doubt that he, at any rate, set a much higher value upon the advancement of knowledge, and the promotion of that freedom of thought which is at once the cause and the consequence of intellectual progress.

Hence I am disposed to think that, if Priestley could be amongst us to-day, the occasion of our meeting would afford him even greater pleasure than the proceedings which celebrated the centenary of his chief discovery. The kindly heart would be moved, the high sense of social duty would be satisfied, by the

1 See Note to Essay XIII.

spectacle of well-earned wealth, neither squandered in tawdry luxury and vainglorious show, nor scattered with the careless charity which blesses neither him that gives nor him that takes, but expended in the execution of a well-considered plan for the aid of present and future generations of those who are willing to help themselves.

We shall all be of one mind thus far. But it is needful to share Priestley's keen interest in physical science; and to have learned, as he had learned, the value of scientific training in fields of inquiry apparently far remote from physical science; in order to appreciate, as he would have appreciated, the value of the noble gift which Sir Josiah Mason has bestowed upon the inhabitants of the Midland district.

For us children of the nineteenth century, however, the establishment of a college under the conditions of Sir Josiah Mason's Trust, has a significance apart from any which it could have possessed a hundred years ago. It appears to be an indication that we are reaching the crisis of the battle, or rather of the long series of battles, which have been fought over education in a campaign which began long before Priestley's time, and will probably not be finished just yet.

In the last century, the combatants were the champions of ancient literature on the one side, and those of modern literature on the other; but, some thirty years ago, the contest became complicated by the appearance of a third army, ranged round the banner of Physical Science.

I am not aware that any one has authority to speak in the name of this new host. For it must be admitted to be somewhat of a guerilla force, composed largely

of irregulars, each of whom fights pretty much for his own hand. But the impressions of a full private, who has seen a good deal of service in the ranks, respecting the present position of affairs and the conditions of a permanent peace, may not be devoid of interest; and I do not know that I could make a better use of the present opportunity than by laying them before you.

From the time that the first suggestion to introduce physical science into ordinary education was timidly whispered, until now, the advocates of scientific education have met with opposition of two kinds. On the one hand, they have been pooh-poohed by the men of business who pride themselves on being the representatives of practicality; while, on the other hand, they have been excommunicated by the classical scholars, in their capacity of Levites in charge of the ark of culture and monopolists of liberal education.

The practical men believed that the idol whom they worship — rule of thumb — has been the source of the past prosperity, and will suffice for the future welfare of the arts and manufactures. They were of opinion that science is speculative rubbish; that theory and practice have nothing to do with one another; and that the scientific habit of mind is an impediment, rather than an aid, in the conduct of ordinary affairs.

I have used the past tense in speaking of the practical men — for although they were very formidable thirty years ago, I am not sure that the pure species has not been extirpated. In fact, so far as mere argument goes, they have been subjected to such a *feu d'enfer* that it is a miracle if any have escaped. But I have

remarked that your typical practical man has an unexpected resemblance to one of Milton's angels. His spiritual wounds, such as are inflicted by logical weapons, may be as deep as a well and as wide as a church door, but beyond shedding a few drops of ichor, celestial or otherwise, he is no whit the worse. So, if any of these opponents be left, I will not waste time in vain repetition of the demonstrative evidence of the practical value of science; but knowing that a parable will sometimes penetrate where syllogisms fail to effect an entrance, I will offer a story for their consideration.

Once upon a time, a boy, with nothing to depend upon but his own vigorous nature, was thrown into the thick of the struggle for existence in the midst of a great manufacturing population. He seems to have had a hard fight, inasmuch as, by the time he was thirty years of age, his total disposable funds amounted to twenty pounds. Nevertheless, middle life found him giving proof of his comprehension of the practical problems he had been roughly called upon to solve, by a career of remarkable prosperity.

Finally, having reached old age with its well-earned surroundings of "honor, troops of friends," the hero of my story bethought himself of those who were making a like start in life, and how he could stretch out a helping hand to them.

After long and anxious reflection this successful practical man of business could devise nothing better than to provide them with the means of obtaining "sound, extensive, and practical scientific knowledge." And he devoted a large part of his wealth and five years of incessant work to this end.

I need not point the moral of a tale which, as the

solid and spacious fabric of the Scientific College assures us, is no fable, nor can anything which I could say intensify the force of this practical answer to practical objections.

We may take it for granted then, that, in the opinion of those best qualified to judge, the diffusion of thorough scientific education is an absolutely essential condition of industrial progress; and that the College which has been opened to-day will confer an inestimable boon upon those whose livelihood is to be gained by the practice of the arts and manufactures of the district.

The only question worth discussion is, whether the conditions, under which the work of the College is to be carried out, are such as to give it the best possible chance of achieving permanent success.

Sir Josiah Mason, without doubt most wisely, has left very large freedom of action to the trustees, to whom he proposes ultimately to commit the administration of the College, so that they may be able to adjust its arrangements in accordance with the changing conditions of the future. But, with respect to three points, he has laid most explicit injunctions upon both administrators and teachers.

Party politics are forbidden to enter into the minds of either, so far as the work of the College is concerned; theology is as sternly banished from its precincts; and finally, it is especially declared that the College shall make no provision for "mere literary instruction and education."

It does not concern me at present to dwell upon the first two injunctions any longer than may be needful to express my full conviction of their wisdom. But

the third prohibition brings us face to face with those other opponents of scientific education, who are by no means in the moribund condition of the practical man, but alive, alert, and formidable.

It is not impossible that we shall hear this express exclusion of "literary instruction and education" from a College which, nevertheless, professes to give a high and efficient education, sharply criticised. Certainly the time was that the Levites of culture would have sounded their trumpets against its walls as against an educational Jericho.

How often have we not been told that the study of physical science is incompetent to confer culture; that it touches none of the higher problems of life; and, what is worse, that the continual devotion to scientific studies tends to generate a narrow and bigoted belief in the applicability of scientific methods to the search after truth of all kinds? How frequently one has reason to observe that no reply to a troublesome argument tells so well as calling its author a "mere scientific specialist." And, as I am afraid it is not permissible to speak of this form of opposition to scientific education in the past tense; may we not expect to be told that this, not only omission, but prohibition, of "mere literary instruction and education" is a patent example of scientific narrow-mindedness?

I am not acquainted with Sir Josiah Mason's reasons for the action which he has taken; but if, as I apprehend is the case, he refers to the ordinary classical course of our schools and universities by the name of "mere literary instruction and education," I venture to offer sundry reasons of my own in support of that action.

For I hold very strongly by two convictions — The first is, that neither the discipline nor the subject-matter of classical education is of such direct value to the student of physical science as to justify the expenditure of valuable time upon either; and the second is, that for the purpose of attaining real culture, an exclusively scientific education is at least as effectual as an exclusively literary education.

I need hardly point out to you that these opinions, especially the latter, are diametrically opposed to those of the great majority of educated Englishmen, influenced as they are by school and university traditions. In their belief, culture is obtainable only by a liberal education; and a liberal education is synonymous, not merely with education and instruction in literature, but in one particular form of literature, namely, that of Greek and Roman antiquity. They hold that the man who has learned Latin and Greek, however little, is educated; while he who is versed in other branches of knowledge, however deeply, is a more or less respectable specialist, not admissible into the cultured caste. The stamp of the educated man, the University degree, is not for him.

I am too well acquainted with the generous catholicity of spirit, the true sympathy with scientific thought, which pervades the writings of our chief apostle of culture to identify him with these opinions; and yet one may cull from one and another of those epistles to the Philistines, which so much delight all who do not answer to that name, sentences which lend them some support.

Mr. Arnold tells us that the meaning of culture is "to know the best that has been thought and said in

the world." It is the criticism of life contained in literature. That criticism regards "Europe as being, for intellectual and spiritual purposes, one great confederation, bound to a joint action and working to a common result; and whose members have, for their common outfit, a knowledge of Greek, Roman, and Eastern antiquity, and of one another. Special, local, and temporary advantages being put out of account, that modern nation will in the intellectual and spiritual sphere make most progress, which most thoroughly carries out this programme. And what is that but saying that we too, all of us, as individuals, the more thoroughly we carry it out, shall make the more progress?" [1]

We have here to deal with two distinct propositions. The first, that a criticism of life is the essence of culture; the second, that literature contains the materials which suffice for the construction of such a criticism.

I think that we must all assent to the first proposition. For culture certainly means something quite different from learning or technical skill. It implies the possession of an ideal, and the habit of critically estimating the value of things by comparison with a theoretic standard. Perfect culture should supply a complete theory of life, based upon a clear knowledge alike of its possibilities and of its limitations.

But we may agree to all this, and yet strongly dissent from the assumption that literature alone is competent to supply this knowledge. After having learnt all that Greek, Roman, and Eastern antiquity have thought and said, and all that modern literatures have to tell us, it is not self-evident that we have laid a

1 *Essays in Criticism*, p. 37.

sufficiently broad and deep foundation for that criticism of life, which constitutes culture.

Indeed, to any one acquainted with the scope of physical science, it is not at all evident. Considering progress only in the "intellectual and spiritual sphere," I find myself wholly unable to admit that either nations or individuals will really advance, if their common outfit draws nothing from the stores of physical science. I should say that an army, without weapons of precision and with no particular base of operations, might more hopefully enter upon a campaign on the Rhine, than a man, devoid of a knowledge of what physical science has done in the last century, upon a criticism of life.

When a biologist meets with an anomaly, he instinctively turns to the study of development to clear it up. The rationale of contradictory opinions may with equal confidence be sought in history.

It is, happily, no new thing that Englishmen should employ their wealth in building and endowing institutions for educational purposes. But, five or six hundred years ago, deeds of foundation expressed or implied conditions as nearly as possible contrary to those which have been thought expedient by Sir Josiah Mason. That is to say, physical science was practically ignored, while a certain literary training was enjoined as a means to the acquirement of knowledge which was essentially theological.

The reason of this singular contradiction between the actions of men alike animated by a strong and disinterested desire to promote the welfare of their fellows, is easily discovered.

At that time, in fact, if any one desired knowledge

beyond such as could be obtained by his own observation, or by common conversation, his first necessity was to learn the Latin language, inasmuch as all the higher knowledge of the western world was contained in works written in that language. Hence, Latin grammar, with logic and rhetoric, studied through Latin, were the fundamentals of education. With respect to the substance of the knowledge imparted through this channel, the Jewish and Christian Scriptures, as interpreted and supplemented by the Romish Church, were held to contain a complete and infallibly true body of information.

Theological dicta were, to the thinkers of those days, that which the axioms and definitions of Euclid are to the geometers of these. The business of the philosophers of the middle ages was to deduce from the data furnished by the theologians, conclusions in accordance with ecclesiastical decrees. They were allowed the high privilege of showing, by logical process, how and why that which the Church said was true, must be true. And if their demonstrations fell short of or exceeded this limit, the Church was maternally ready to check their aberrations; if need were by the help of the secular arm.

Between the two, our ancestors were furnished with a compact and complete criticism of life. They were told how the world began and how it would end; they learned that all material existence was but a base and insignificant blot upon the fair face of the spiritual world, and that nature was, to all intents and purposes, the play-ground of the devil; they learned that the earth is the center of the visible universe, and that man is the cynosure of things terrestrial; and more especially

was it inculcated that the course of nature had no fixed order, but that it could be, and constantly was, altered by the agency of innumerable spiritual beings, good and bad, according as they were moved by the deeds and prayers of men. The sum and substance of the whole doctrine was to produce the conviction that the only thing really worth knowing in this world was how to secure that place in a better which, under certain conditions, the Church promised.

Our ancestors had a living belief in this theory of life, and acted upon it in their dealings with education, as in all other matters. Culture meant saintliness — after the fashion of the saints of those days; the education that led to it was, of necessity, theological; and the way to theology lay through Latin.

That the study of nature — further than was requisite for the satisfaction of everyday wants — should have any bearing on human life was far from the thoughts of men thus trained. Indeed, as nature had been cursed for man's sake, it was an obvious conclusion that those who meddled with nature were likely to come into pretty close contact with Satan. And, if any born scientific investigator followed his instincts, he might safely reckon upon earning the reputation, and probably upon suffering the fate, of a sorcerer.

Had the western world been left to itself in Chinese isolation, there is no saying how long this state of things might have endured. But, happily, it was not left to itself. Even earlier than the thirteenth century, the development of Moorish civilization in Spain and the great movement of the Crusades had introduced the leaven which, from that day to this, has never ceased to work. At first, through the intermediation of Arabic

translations, afterwards by the study of the originals, the western nations of Europe became acquainted with the writings of the ancient philosophers and poets, and, in time, with the whole of the vast literature of antiquity.

Whatever there was of high intellectual aspiration or dominant capacity in Italy, France, Germany, and England, spent itself for centuries in taking possession of the rich inheritance left by the dead civilizations of Greece and Rome. Marvelously aided by the invention of printing, classical learning spread and flourished. Those who possessed it prided themselves on having attained the highest culture then within the reach of mankind.

And justly. For, saving Dante on his solitary pinnacle, there was no figure in modern literature at the time of the Renascence to compare with the men of antiquity; there was no art to compete with their sculpture; there was no physical science but that which Greece had created. Above all, there was no other example of perfect intellectual freedom — of the unhesitating acceptance of reason as the sole guide to truth and the supreme arbiter of conduct.

The new learning necessarily soon exerted a profound influence upon education. The language of the monks and schoolmen seemed little better than gibberish to scholars fresh from Virgil and Cicero, and the study of Latin was placed upon a new foundation. Moreover, Latin itself ceased to afford the sole key to knowledge. The student who sought the highest thought of antiquity, found only a second-hand reflection of it in Roman literature, and turned his face to the full light of the Greeks. And after a battle, not

altogether dissimilar to that which is at present being fought over the teaching of physical science, the study of Greek was recognized as an essential element of all higher education.

Thus the Humanists, as they were called, won the day; and the great reform which they effected was of incalculable service to mankind. But the Nemesis of all reformers is finality; and the reformers of education, like those of religion, fell into the profound, however common, error of mistaking the beginning for the end of the work of reformation.

The representatives of the Humanists, in the nineteenth century, take their stand upon classical education as the sole avenue to culture, as firmly as if we were still in the age of Renascence. Yet, surely, the present intellectual relations of the modern and the ancient worlds are profoundly different from those which obtained three centuries ago. Leaving aside the existence of a great and characteristically modern literature, of modern painting, and, especially, of modern music, there is one feature of the present state of the civilized world which separates it more widely from the Renascence, than the Renascence was separated from the middle ages.

This distinctive character of our own times lies in the vast and constantly increasing part which is played by natural knowledge. Not only is our daily life shaped by it, not only does the prosperity of millions of men depend upon it, but our whole theory of life has long been influenced, consciously or unconsciously, by the general conceptions of the universe, which have been forced upon us by physical science.

In fact, the most elementary acquaintance with the

results of scientific investigation shows us that they offer a broad and striking contradiction to the opinion so implicitly credited and taught in the middle ages.

The notions of the beginning and the end of the world entertained by our forefathers are no longer credible. It is very certain that the earth is not the chief body in the material universe, and that the world is not subordinated to man's use. It is even more certain that nature is the expression of a definite order with which nothing interferes, and that the chief business of mankind is to learn that order and govern themselves accordingly. Moreover this scientific "criticism of life" presents itself to us with different credentials from any other. It appeals not to authority, nor to what anybody may have thought or said, but to nature. It admits that all our interpretations of natural fact are more or less imperfect and symbolic, and bids the learner seek for truth not among words but among things. It warns us that the assertion which outstrips evidence is not only a blunder but a crime.

The purely classical education advocated by the representatives of the Humanists in our day, gives no inkling of all this. A man may be a better scholar than Erasmus, and know no more of the chief causes of the present intellectual fermentation than Erasmus did. Scholarly and pious persons, worthy of all respect, favor us with allocutions upon the sadness of the antagonism of science to their mediæval way of thinking, which betray an ignorance of the first principles of scientific investigation, an incapacity for understanding what a man of science means by veracity, and an unconsciousness of the weight of established scientific truths, which is almost comical.

There is no great force in the *tu quoque* argument, or else the advocates of scientific education might fairly enough retort upon the modern Humanists that they may be learned specialists, but that they possess no such sound foundation for a criticism of life as deserves the name of culture. And, indeed, if we were disposed to be cruel, we might urge that the Humanists have brought this reproach upon themselves, not because they are too full of the spirit of the ancient Greek, but because they lack it.

The period of the Renascence is commonly called that of the "Revival of Letters," as if the influences then brought to bear upon the mind of Western Europe had been wholly exhausted in the field of literature. I think it is very commonly forgotten that the revival of science, effected by the same agency, although less conspicuous, was not less momentous.

In fact, the few and scattered students of nature of that day picked up the clew to her secrets exactly as it fell from the hands of the Greeks a thousand years before. The foundations of mathematics were so well laid by them, that our children learn their geometry from a book written for the schools of Alexandria two thousand years ago. Modern astronomy is the natural continuation and development of the work of Hipparchus and of Ptolemy; modern physics of that of Democritus and of Archimedes; it was long before modern biological science outgrew the knowledge bequeathed to us by Aristotle, by Theophrastus, and by Galen.

We cannot know all the best thoughts and sayings of the Greeks unless we know what they thought about natural phenomena. We cannot fully apprehend their criticism of life unless we understand the extent to

which that criticism was affected by scientific conceptions. We falsely pretend to be the inheritors of their culture, unless we are penetrated, as the best minds among them were, with an unhesitating faith that the free employment of reason, in accordance with scientific method, is the sole method of reaching truth.

Thus I venture to think that the pretensions of our modern Humanists to the possession of the monopoly of culture and to the exclusive inheritance of the spirit of antiquity must be abated, if not abandoned. But I should be very sorry that anything I have said should be taken to imply a desire on my part to depreciate the value of classical education, as it might be and as it sometimes is. The native capacities of mankind vary no less than their opportunities; and while culture is one, the road by which one man may best reach it is widely different from that which is most advantageous to another. Again, while scientific education is yet inchoate and tentative, classical education is thoroughly well organized upon the practical experience of generations of teachers. So that, given ample time for learning and destination for ordinary life, or for a literary career, I do not think that a young Englishman in search of culture can do better than follow the course usually marked out for him, supplementing its deficiencies by his own efforts.

But for those who mean to make science their serious occupation; or who intend to follow the profession of medicine; or who have to enter early upon the business of life; for all these, in my opinion, classical education is a mistake; and it is for this reason that I am glad to see "mere literary education and instruction" shut out from the curriculum of Sir Josiah Mason's College,

seeing that its inclusion would probably lead to the introduction of the ordinary smattering of Latin and Greek.

Nevertheless, I am the last person to question the importance of genuine literary education, or to suppose that intellectual culture can be complete without it. An exclusively scientific training will bring about a mental twist as surely as an exclusively literary training. The value of the cargo does not compensate for a ship's being out of trim; and I should be very sorry to think that the Scientific College would turn out none but lop-sided men.

There is no need, however, that such a catastrophe should happen. Instruction in English, French, and German is provided, and thus the three greatest literatures of the modern world are made accessible to the student.

French and German, and especially the latter language, are absolutely indispensable to those who desire full knowledge in any department of science. But even supposing that the knowledge of these languages acquired is not more than sufficient for purely scientific purposes, every Englishman has, in his native tongue, an almost perfect instrument of literary expression; and, in his own literature, models of every kind of literary excellence. If an Englishman cannot get literary culture out of his Bible, his Shakespeare, his Milton, neither, in my belief, will the profoundest study of Homer and Sophocles, Virgil and Horace, give it to him.

Thus, since the constitution of the College makes sufficient provision for literary as well as for scientific education, and since artistic instruction is also con-

templated, it seems to me that a fairly complete culture is offered to all who are willing to take advantage of it.

But I am not sure that at this point the "practical" man, scotched but not slain, may not ask what all this talk about culture has to do with an Institution, the object of which is defined to be "to promote the prosperity of the manufactures and the industry of the country." He may suggest that what is wanted for this end is not culture, nor even a purely scientific discipline, but simply a knowledge of applied science.

I often wish that this phrase, "applied science," had never been invented. For it suggests that there is a sort of scientific knowledge of direct practical use, which can be studied apart from another sort of scientific knowledge, which is of no practical utility, and which is termed "pure science." But there is no more complete fallacy than this. What people call applied science is nothing but the application of pure science to particular classes of problems. It consists of deductions from those general principles, established by reasoning and observation, which constitute pure science. No one can safely make these deductions until he has a firm grasp of the principles; and he can obtain that grasp only by personal experience of the operations of observation and of reasoning on which they are founded.

Almost all the processes employed in the arts and manufactures fall within the range either of physics or of chemistry. In order to improve them, one must thoroughly understand them; and no one has a chance of really understanding them, unless he has obtained that mastery of principles and that habit of dealing with facts, which is given by long-continued and well-

directed purely scientific training in the physical and the chemical laboratory. So that there really is no question as to the necessity of purely scientific discipline, even if the work of the College were limited by the narrowest interpretation of its stated aims.

And, as to the desirableness of a wider culture than that yielded by science alone, it is to be recollected that the improvement of manufacturing processes is only one of the conditions which contribute to the prosperity of industry. Industry is a means and not an end; and mankind work only to get something which they want. What that something is depends partly on their innate, and partly on their acquired, desires.

If the wealth resulting from prosperous industry is to be spent upon the gratification of unworthy desires, if the increasing perfection of manufacturing processes is to be accompanied by an increasing debasement of those who carry them on, I do not see the good of industry and prosperity.

Now it is perfectly true that men's views of what is desirable depend upon their characters; and that the innate proclivities to which we give that name are not touched by any amount of instruction. But it does not follow that even mere intellectual education may not, to an indefinite extent, modify the practical manifestation of the characters of men in their actions, by supplying them with motives unknown to the ignorant. A pleasure-loving character will have pleasure of some sort; but, if you give him the choice, he may prefer pleasures which do not degrade him to those which do. And this choice is offered to every man, who possesses in literary or artistic culture a never-failing source of pleasures, which are neither withered

by age, nor staled by custom, nor embittered in the recollection by the pangs of self-reproach.

If the Institution opened to-day fulfils the intention of its founder, the picked intelligences among all classes of the population of this district will pass through it. No child born in Birmingham, henceforward, if he have the capacity to profit by the opportunities offered to him, first in the primary and other schools, and afterwards in the Scientific College, need fail to obtain, not merely the instruction, but the culture most appropriate to the conditions of his life.

Within these walls, the future employer and the future artisan may sojourn together for a while, and carry, through all their lives, the stamp of the influences then brought to bear upon them. Hence, it is not beside the mark to remind you, that the prosperity of industry depends not merely upon the improvement of manufacturing processes, not merely upon the ennobling of the individual character, but upon a third condition, namely, a clear understanding of the conditions of social life, on the part of both the capitalist and the operative, and their agreement upon common principles of social action. They must learn that social phenomena are as much the expression of natural laws as any others; that no social arrangements can be permanent unless they harmonise with the requirements of social statics and dynamics; and that, in the nature of things, there is an arbiter whose decisions execute themselves.

But this knowledge is only to be obtained by the application of the methods of investigation adopted in physical researches to the investigation of the phenomena of society. Hence, I confess, I should like

to see one addition made to the excellent scheme of education propounded for the College, in the shape of provision for the teaching of Sociology. For though we are all agreed that party politics are to have no place in the instruction of the College; yet in this country, practically governed as it is now by universal suffrage, every man who does his duty must exercise political functions. And, if the evils which are inseparable from the good of political liberty are to be checked, if the perpetual oscillation of nations between anarchy and despotism is to be replaced by the steady march of self-restraining freedom; it will be because men will gradually bring themselves to deal with political, as they now deal with scientific questions; to be as ashamed of undue haste and partisan prejudice in the one case as in the other; and to believe that the machinery of society is at least as delicate as that of a spinning jenny, and as little likely to be improved by the meddling of those who have not taken the trouble to master the principles of its action.

XVII

Literature and Science

By Matthew Arnold [1]

PRACTICAL people talk with a smile of Plato and of his absolute ideas; and it is impossible to deny that Plato's ideas do often seem unpractical and impracticable, and especially when one views them in connection with the life of a great work-a-day world like the United States. The necessary staple of the life of such a world Plato regards with disdain; handicraft and trade and the working professions he regards with disdain; but what becomes of the life of an industrial modern community if you take handicraft and trade and the working professions out of it? The base mechanic arts and handicrafts, says Plato, bring about a natural weakness in the principle of excellence in a man, so that he cannot govern the ignoble growths in him, but nurses them, and cannot understand fostering any other. Those who exercise such arts and trades,

1 "Literature and Science" was one of the addresses which Arnold delivered on a lecture tour in the United States in 1883–4; it was printed in 1885 in the volume *Discourses in America*. It is an answer to Huxley's "Science and Culture," which precedes it in this collection.

Matthew Arnold, 1822–1888, was equally well known as poet and as critic. He published volumes of poems in 1852, 1853, and 1855; he was Professor of Poetry at Oxford 1857–1867, and published during this period three volumes of critical essays; in 1869 in *Culture and Anarchy* he gave the fullest exposition of his gospel of culture, as applied to the manifold political and industrial problems of his day. Beginning with *Literature and Dogma* in 1873, Arnold published several volumes of higher criticism.— EDITOR.

as they have their bodies, he says, marred by their vulgar businesses, so they have their souls, too, bowed and broken by them. And if one of these uncomely people has a mind to seek self-culture and philosophy, Plato compares him to a bald little tinker, who has scraped together money, and has got his release from service, and has had a bath, and bought a new coat, and is rigged out like a bridegroom about to marry the daughter of his master who has fallen into poor and helpless estate.

Nor do the working professions fare any better than trade at the hands of Plato. He draws for us an inimitable picture of the working lawyer, and of his life of bondage; he shows how this bondage from his youth up has stunted and warped him, and made him small and crooked of soul, encompassing him with difficulties which he is not man enough to rely on justice and truth as means to encounter, but has recourse, for help out of them, to falsehood and wrong. And so, says Plato, this poor creature is bent and broken, and grows up from boy to man without a particle of soundness in him, although exceedingly smart and clever in his own esteem.

One cannot refuse to admire the artist who draws these pictures. But we say to ourselves that his ideas show the influence of a primitive and obsolete order of things, when the warrior caste and the priestly caste were alone in honor, and the humble work of the world was done by slaves. We have now changed all that; the modern majority [1] consists in work, as Emerson de-

1 Emerson's sentence is: "Feudalism and Orientalism had long enough thought it majestic to do nothing; the modern majesty consists in work."—"Literary Ethics," Centenary Edition, I, 179.—EDITOR.

clares; and in work, we may add, principally of such plain and dusty kind as the work of cultivators of the ground, handicraftsmen, men of trade and business, men of the working professions. Above all is this true in a great industrious community such as that of the United States.

Now education, many people go on to say, is still mainly governed by the ideas of men like Plato, who lived when the warrior caste and the priestly or philosophical class were alone in honor, and the really useful part of the community were slaves. It is an education fitted for persons of leisure in such a community. This education passed from Greece and Rome to the feudal communities of Europe, where also the warrior caste and the priestly caste were alone held in honor, and where the really useful and working part of the community, though not nominally slaves as in the pagan world, were practically not much better off than slaves, and not more seriously regarded. And how absurd it is, people end by saying, to inflict this education upon an industrious modern community, where very few indeed are persons of leisure, and the mass to be considered has not leisure, but is bound, for its own great good, and for the great good of the world at large, to plain labor and to industrial pursuits, and the education in question tends necessarily to make men dissatisfied with these pursuits and unfitted for them!

That is what is said. So far I must defend Plato, as to plead that his view of education and studies is in the general, as it seems to me, sound enough, and fitted for all sorts and conditions of men, whatever their pursuits may be. "An intelligent man," says

Plato, "will prize those studies which result in his soul getting soberness, righteousness, and wisdom, and will less value the others." I cannot consider *that* a bad description of the aim of education, and of the motives which should govern us in the choice of studies, whether we are preparing ourselves for a hereditary seat in the English House of Lords or for the pork trade in Chicago.

Still I admit that Plato's world was not ours, that his scorn of trade and handicraft is fantastic, that he had no conception of a great industrial community such as that of the United States, and that such a community must and will shape its education to suit its own needs. If the usual education handed down to it from the past does not suit it, it will certainly before long drop this and try another. The usual education in the past has been mainly literary. The question is whether the studies which were long supposed to be the best for all of us are practically the best now; whether others are not better. The tyranny of the past, many think, weighs on us injuriously in the predominance given to letters in education. The question is raised whether, to meet the needs of our modern life, the predominance ought not now to pass from letters to science; and naturally the question is nowhere raised with more energy than here in the United States. The design of abasing what is called "mere literary instruction and education," and of exalting what is called "sound, extensive, and practical scientific knowledge," is, in this intensely modern world of the United States, even more perhaps than in Europe, a very popular design, and makes great and rapid progress.

I am going to ask whether the present movement for ousting letters from their old predominance in education, and for transferring the predominance in education to the natural sciences, whether this brisk and flourishing movement ought to prevail, and whether it is likely that in the end it really will prevail. An objection may be raised which I will anticipate. My own studies have been almost wholly in letters, and my visits to the field of the natural sciences have been very slight and inadequate, although those sciences have always strongly moved my curiosity. A man of letters, it will perhaps be said, is not competent to discuss the comparative merits of letters and natural science as means of education. To this objection I reply, first of all, that his incompetence, if he attempts the discussion but is really incompetent for it, will be abundantly visible; nobody will be taken in; he will have plenty of sharp observers and critics to save mankind from that danger. But the line I am going to follow is, as you will soon discover, so extremely simple, that perhaps it may be followed without failure even by one who for a more ambitious line of discussion would be quite incompetent.

Some of you may possibly remember a phrase of mine which has been the object of a good deal of comment; an observation to the effect that in our culture, the aim being *to know ourselves and the world,* we have, as the means to this end, *to know the best which has been thought and said in the world.* A man of science, who is also an excellent writer and the very prince of debaters, Professor Huxley, in a discourse at the opening of Sir Josiah Mason's college at Birmingham, laying hold of this phrase, expanded it by

quoting some more words of mine, which are these: "The civilized world is to be regarded as now being, for intellectual and spiritual purposes, one great confederation, bound to a joint action and working to a common result; and whose members have for their proper outfit a knowledge of Greek, Roman, and Eastern antiquity, and of one another. Special local and temporary advantages being put out of account, that modern nation will in the intellectual and spiritual sphere make most progress, which most thoroughly carries out this programme."

Now on my phrase, thus enlarged, Professor Huxley remarks that when I speak of the above-mentioned knowledge as enabling us to know ourselves and the world, I assert *literature* to contain the materials which suffice for thus making us know ourselves and the world. But it is not by any means clear, says he, that after having learnt all which ancient and modern literatures have to tell us, we have laid a sufficiently broad and deep foundation for that criticism of life, that knowledge of ourselves and the world, which constitutes culture. On the contrary, Professor Huxley declares that he finds himself "wholly unable to admit that either nations or individuals will really advance, if their outfit draws nothing from the stores of physical science. An army without weapons of precision, and with no particular base of operations, might more hopefully enter upon a campaign on the Rhine, than a man, devoid of a knowledge of what physical science has done in the last century, upon a criticism of life."

This shows how needful it is for those who are to discuss any matter together, to have a common under-

standing as to the sense of the terms they employ,—how needful, and how difficult. What Professor Huxley says, implies just the reproach which is so often brought against the study of *belles-lettres,* as they are called: that the study is an elegant one, but slight and ineffectual; a smattering of Greek and Latin and other ornamental things, of little use for anyone whose object is to get at truth, and to be a practical man. So, too, M. Renan talks of the "superficial humanism" of a school-course which treats us as if we were all going to be poets, writers, preachers, orators, and he opposes this humanism to positive science, or the critical search after truth. And there is always a tendency in those who are remonstrating against the predominance of letters in education, to understand by letters *belles-lettres,* and by *belles-lettres* a superficial humanism, the opposite of science or true knowledge.

But when we talk of knowing Greek and Roman antiquity, for instance, which is the knowledge people have called the humanities, I for my part mean a knowledge which is something more than a superficial humanism, mainly decorative. "I call all teaching *scientific,*" says Wolf, the critic of Homer, "which is systematically laid out and followed up to its original sources. For example: a knowledge of classical antiquity is scientific when the remains of classical antiquity are correctly studied in the original languages." There can be no doubt that Wolf is perfectly right; that all learning is scientific which is systematically laid out and followed up to its original sources, and that a genuine humanism is scientific.

When I speak of knowing Greek and Roman antiquity, therefore, as a help to knowing ourselves and

the world, I mean more than a knowledge of so much vocabulary, so much grammar, so many portions of authors in the Greek and Latin languages. I mean knowing the Greeks and Romans, and their life and genius, and what they were and did in the world; what we get from them, and what is its value. That, at least, is the ideal; and when we talk of endeavoring to know Greek and Roman antiquity, as a help to knowing ourselves and the world, we mean endeavoring so to know them as to satisfy this ideal, however much we may still fall short of it.

The same also as to knowing our own and other modern nations, with the like aim of getting to understand ourselves and the world. To know the best that has been thought and said by the modern nations, is to know, says Professor Huxley, "only what modern *literatures* have to tell us; it is the criticism of life contained in modern literature." And yet "the distinctive character of our times," he urges, "lies in the vast and constantly increasing part which is played by natural knowledge." And how, therefore, can a man, devoid of knowledge of what physical science has done in the last century, enter hopefully upon a criticism of modern life?

Let us, I say, be agreed about the meaning of the terms we are using. I talk of knowing the best which has been thought and uttered in the world; Professor Huxley says this means knowing *literature*. Literature is a large word; it may mean everything written with letters or printed in a book. Euclid's *Elements* and Newton's *Principia* are thus literature. All knowledge that reaches us through books is literature. But by literature Professor Huxley means *belles-lettres*. He

means to make me say, that knowing the best which has been thought and said by the modern nations is knowing their *belles-lettres* and no more. And this is no sufficient equipment, he argues, for a criticism of modern life. But as I do not mean, by knowing ancient Rome, knowing merely more or less of Latin *belles-lettres,* and taking no account of Rome's military, and political, and legal, and administrative work in the world; and as, by knowing ancient Greece, I understand knowing her as the giver of Greek art, and the guide to a free and right use of reason and to scientific method, and the founder of our mathematics and physics and astronomy and biology,— I understand knowing her as all this, and not merely knowing certain Greek poems, and histories, and treatises, and speeches,— so as to the knowledge of modern nations also. By knowing modern nations, I mean not merely knowing their *belles-lettres,* but knowing also what has been done by such men as Copernicus, Galileo, Newton, Darwin. "Our ancestors learned," says Professor Huxley, "that the earth is the center of the visible universe, and that man is the cynosure of things terrestrial; and more especially was it inculcated that the course of nature had no fixed order, but that it could be, and constantly was, altered." But for us now, continues Professor Huxley, "the notions of the beginning and the end of the world entertained by our forefathers are no longer credible. It is very certain that the earth is not the chief body in the material universe, and that the world is not subordinated to man's use. It is even more certain that nature is the expression of a definite order, with which nothing interferes." "And yet," he cries, "the purely clas-

sical education advocated by the representatives of the humanists in our day gives no inkling of all this!"

In due place and time I will just touch upon that vexed question of classical education; but at present the question is as to what is meant by knowing the best which modern nations have thought and said. It is not knowing their *belles-lettres* merely which is meant. To know Italian *belles-lettres* is not to know Italy, and to know English *belles-lettres* is not to know England. Into knowing Italy and England there comes a great deal more, Galileo and Newton amongst it. The reproach of being a superficial humanism, a tincture of *belles-lettres,* may attach rightly enough to some other disciplines; but to the particular discipline recommended when I proposed knowing the best that has been thought and said in the world, it does not apply. In that best I certainly include what in modern times has been thought and said by the great observers and knowers of nature.

There is, therefore, really no question between Professor Huxley and me as to whether knowing the great results of the modern scientific study of nature is not required as a part of our culture, as well as knowing the products of literature and art. But to follow the processes by which those results are reached, ought, say the friends of physical science, to be made the staple of education for the bulk of mankind. And here there does arise a question between those whom Professor Huxley calls with playful sarcasm "the Levites of culture," and those whom the poor humanist is sometimes apt to regard as its Nebuchadnezzars.

The great results of the scientific investigation of

nature we are agreed upon knowing, but how much of our study are we bound to give to the processes by which those results are reached? The results have their visible bearing on human life. But all the processes, too, all the items of fact, by which those results are reached and established, are interesting. All knowledge is interesting to a wise man, and the knowledge of nature is interesting to all men. It is very interesting to know, that, from the albuminous white of the egg, the chick in the egg gets the materials for its flesh, bones, blood, and feathers; while, from the fatty yolk of the egg, it gets the heat and energy which enable it at length to break its shell and begin the world. It is less interesting, perhaps, but still it is interesting, to know that when a taper burns, the wax is converted into carbonic acid and water. Moreover, it is quite true that the habit of dealing with facts, which is given by the study of nature, is, as the friends of physical science praise it for being, an excellent discipline. The appeal, in the study of nature, is constantly to observation and experiment; not only is it said that the thing is so, but we can be made to see that it is so. Not only does a man tell us that when a taper burns the wax is converted into carbonic acid and water, as a man may tell us, if he likes, that Charon is punting his ferry-boat on the river Styx, or that Victor Hugo is a sublime poet, or Mr. Gladstone the most admirable of statesmen; but we are made to see that the conversion into carbonic acid and water does actually happen. This reality of natural knowledge it is, which makes the friends of physical science contrast it, as a knowledge of things, with the humanist's knowledge, which is, say they, a knowledge of words. And hence Professor

Huxley is moved to lay it down that, "for the purpose of attaining real culture, an exclusively scientific education is at least as effectual as an exclusively literary education." And a certain President of the Section for Mechanical Science in the British Association is, in Scripture phrase, "very bold," and declares that if a man, in his mental training, "has substituted literature and history for natural science, he has chosen the less useful alternative." But whether we go these lengths or not, we must all admit that in natural science the habit gained of dealing with facts is a most valuable discipline, and that everyone should have some experience of it.

More than this, however, is demanded by the reformers. It is proposed to make the training in natural science the main part of education, for the great majority of mankind at any rate. And here, I confess, I part company with the friends of physical science, with whom up to this point I have been agreeing. In differing from them, however, I wish to proceed with the utmost caution and diffidence. The smallness of my own acquaintance with the disciplines of natural science is ever before my mind, and I am fearful of doing these disciplines an injustice. The ability and pugnacity of the partisans of natural science make them formidable persons to contradict. The tone of tentative inquiry, which befits a being of dim faculties and bounded knowledge, is the tone I would wish to take and not to depart from. At present it seems to me, that those who are for giving to natural knowledge, as they call it, the chief place in the education of the majority of mankind, leave one important thing out of their account: the constitution of human

nature. But I put this forward on the strength of some facts not at all recondite, very far from it; facts capable of being stated in the simplest possible fashion, and to which, if I so state them, the man of science will, I am sure, be willing to allow their due weight.

Deny the facts altogether, I think, he hardly can. He can hardly deny, that when we set ourselves to enumerate the powers which go to the building up of human life, and say that they are the power of conduct, the power of intellect and knowledge, the power of beauty, and the power of social life and manners,— he can hardly deny that this scheme, though drawn in rough and plain lines enough, and not pretending to scientific exactness, does yet give a fairly true representation of the matter. Human nature is built up by these powers; we have the need for them all. When we have rightly met and adjusted the claims of them all, we shall then be in a fair way for getting soberness and righteousness, with wisdom. This is evident enough, and the friends of physical science would admit it.

But perhaps they may not have sufficiently observed another thing: namely, that the several powers just mentioned are not isolated, but there is, in the generality of mankind, a perpetual tendency to relate them one to another in divers ways. With one such way of relating them I am particularly concerned now. Following our instinct for intellect and knowledge, we acquire pieces of knowledge; and presently, in the generality of men, there arises the desire to relate these pieces of knowledge to our sense for conduct, to our sense for beauty,— and there is weariness and dissatisfaction if the desire is balked. Now in this desire

lies, I think, the strength of that hold which letters have upon us.

All knowledge is, as I said just now, interesting; and even items of knowledge which from the nature of the case cannot well be related, but must stand isolated in our thoughts, have their interest. Even lists of exceptions have their interest. If we are studying Greek accents, it is interesting to know that *pais* and *pas,* and some other monosyllables of the same form of declension, do not take the circumflex upon the last syllable of the genitive plural, but vary, in this respect, from the common rule. If we are studying physiology, it is interesting to know that the pulmonary artery carries dark blood and the pulmonary vein carries bright blood, departing in this respect from the common rule for the division of labor between the veins and the arteries. But everyone knows how we seek naturally to combine the pieces of our knowledge together, to bring them under general rules, to relate them to principles; and how unsatisfactory and tiresome it would be to go on forever learning lists of exceptions, or accumulating items of fact which must stand isolated.

Well, that same need of relating our knowledge, which operates here within the sphere of our knowledge itself, we shall find operating, also, outside that sphere. We experience, as we go on learning and knowing,— the vast majority of us experience,— the need of relating what we have learnt and known to the sense which we have in us for conduct, to the sense which we have in us for beauty.

A certain Greek prophetess of Mantineia in Arcadia, Diotima by name, once explained to the philosopher Socrates that love, and impulse, and bent of all kinds,

is, in fact, nothing else but the desire in men that good should forever be present to them. This desire for good, Diotima assured Socrates, is our fundamental desire, of which fundamental desire every impulse in us is only some one particular form. And therefore this fundamental desire it is, I suppose,— this desire in men that good should be forever present to them,— which acts in us when we feel the impulse for relating our knowledge to our sense for conduct and to our sense for beauty. At any rate, with men in general the instinct exists. Such is human nature. And the instinct, it will be admitted, is innocent, and human nature is preserved by our following the lead of its innocent instincts. Therefore, in seeking to gratify this instinct in question, we are following the instinct of self-preservation in humanity.

But, no doubt, some kinds of knowledge cannot be made to directly serve the instinct in question, cannot be directly related to the sense for beauty, to the sense for conduct. These are instrument-knowledges; they lead on to other knowledges, which can. A man who passes his life in instrument-knowledges is a specialist. They may be invaluable as instruments to something beyond, for those who have the gift thus to employ them; and they may be disciplines in themselves wherein it is useful for everyone to have some schooling. But it is inconceivable that the generality of men should pass all their mental life with Greek accents or with formal logic. My friend Professor Sylvester, who is one of the first mathematicians in the world, holds transcendental doctrines as to the virtue of mathematics, but those doctrines are not for common men. In the very Senate House and heart of our English

Cambridge I once ventured, though not without an apology for my profaneness, to hazard the opinion that for the majority of mankind a little of mathematics, even, goes a long way. Of course this is quite consistent with their being of immense importance as an instrument to something else; but it is the few who have the aptitude for thus using them, not the bulk of mankind.

The natural sciences do not, however, stand on the same footing with these instrument-knowledges. Experience shows us that the generality of men will find more interest in learning that, when a taper burns, the wax is converted into carbonic acid and water, or in learning the explanation of the phenomenon of dew, or in learning how the circulation of the blood is carried on, than they find in learning that the genitive plural of *pais* and *pas* does not take the circumflex on the termination. And one piece of natural knowledge is added to another, and others are added to that, and at last we come to propositions so interesting as Mr. Darwin's famous proposition that "our ancestor was a hairy quadruped furnished with a tail and pointed ears, probably arboreal in his habits." Or we come to propositions of such reach and magnitude as those which Professor Huxley delivers, when he says that the notions of our forefathers about the beginning and the end of the world were all wrong, and that nature is the expression of a definite order with which nothing interferes.

Interesting, indeed, these results of science are, important they are, and we should all of us be acquainted with them. But what I now wish you to mark is, that we are still, when they are propounded to us and we

receive them, we are still in the sphere of intellect and knowledge. And for the generality of men there will be found, I say, to arise, when they have duly taken in the proposition that their ancestor was "a hairy quadruped furnished with a tail and pointed ears, probably arboreal in his habits," there will be found to arise an invincible desire to relate this proposition to the sense in us for conduct, and to the sense in us for beauty. But this the men of science will not do for us, and will hardly even profess to do. They will give us other pieces of knowledge, other facts, about other animals and their ancestors, or about plants, or about stones, or about stars; and they may finally bring us to those great "general conceptions of the universe, which are forced upon us all," says Professor Huxley, "by the progress of physical science." But still it will be *knowledge* only which they give us; knowledge not put for us into relation with our sense for conduct, our sense for beauty, and touched with emotion by being so put; not thus put for us, and therefore, to the majority of mankind, after a certain while, unsatisfying, wearying.

Not to the born naturalist, I admit. But what do we mean by a born naturalist? We mean a man in whom the zeal for observing nature is so uncommonly strong and eminent, that it marks him off from the bulk of mankind. Such a man will pass his life happily in collecting natural knowledge and reasoning upon it, and will ask for nothing, or hardly anything, more. I have heard it said that the sagacious and admirable naturalist whom we lost not very long ago, Mr. Darwin, once owned to a friend that for his part he did not experience the necessity for two things

which most men find so necessary to them,— religion and poetry; science and the domestic affections, he thought, were enough. To a born naturalist, I can well understand that this should seem so. So absorbing is his occupation with nature, so strong his love for his occupation, that he goes on acquiring natural knowledge and reasoning upon it, and has little time or inclination for thinking about getting it related to the desire in man for conduct, the desire in man for beauty. He relates it to them for himself as he goes along, so far as he feels the need; and he draws from the domestic affections all the additional solace necessary. But then Darwins are extremely rare. Another great and admirable master of natural knowledge, Faraday, was a Sandemanian. That is to say, he related his knowledge to his instinct for conduct and to his instinct for beauty, by the aid of that respectable Scottish sectary, Robert Sandeman. And so strong, in general, is the demand of religion and poetry to have their share in a man, to associate themselves with his knowing, and to relieve and rejoice it, that, probably, for one man amongst us with the disposition to do as Darwin did in this respect, there are at least fifty with the disposition to do as Faraday.

Education lays hold upon us, in fact, by satisfying this demand. Professor Huxley holds up to scorn mediæval education, with its neglect of the knowledge of nature, its poverty even of literary studies, its formal logic devoted to "showing how and why that which the Church said was true must be true." But the great mediæval Universities were not brought into being, we may be sure, by the zeal for giving a jejune and contemptible education. Kings have been their nursing

fathers, and queens have been their nursing mothers, but not for this. The mediæval Universities came into being, because the supposed knowledge, delivered by Scripture and the Church, so deeply engaged men's hearts, by so simply, easily, and powerfully relating itself to their desire for conduct, their desire for beauty. All other knowledge was dominated by this supposed knowledge and was subordinated to it, because of the surpassing strength of the hold which it gained upon the affections of men, by allying itself profoundly with their sense for conduct, their sense for beauty.

But now, says Professor Huxley, conceptions of the universe fatal to the notions held by our forefathers have been forced upon us by physical science. Grant to him that they are thus fatal, that the new conceptions must and will soon become current everywhere, and that every one will finally perceive them to be fatal to the beliefs of our forefathers. The need of humane letters, as they are truly called, because they serve the paramount desire in men that good should be for ever present to them,— the need of humane letters, to establish a relation between the new conceptions, and our instinct for beauty, our instinct for conduct, is only the more visible. The Middle Age could do without humane letters, as it could do without the study of nature, because its supposed knowledge was made to engage its emotions so powerfully. Grant that the supposed knowledge disappears, its power of being made to engage the emotions will of course disappear along with it,— but the emotions themselves, and their claim to be engaged and satisfied, will remain. Now if we find by experience that humane letters have an

undeniable power of engaging the emotions, the importance of humane letters in a man's training becomes not less, but greater, in proportion to the success of modern science in extirpating what it calls "mediæval thinking."

Have humane letters, then, have poetry and eloquence, the power here attributed to them of engaging the emotions, and do they exercise it? And if they have it and exercise it, *how* do they exercise it, so as to exert an influence upon man's sense for conduct, his sense for beauty? Finally, even if they both can and do exert an influence upon the senses in question, how are they to relate to them the results,— the modern results,— of natural science? All these questions may be asked. First, have poetry and eloquence the power of calling out the emotions? The appeal is to experience. Experience shows that for the vast majority of men, for mankind in general, they have the power. Next, do they exercise it? They do. But then, *how* do they exercise it so as to affect man's sense for conduct, his sense for beauty? And this is perhaps a case for applying the Preacher's words: "Though a man labor to seek it out, yet he shall not find it; yea, farther, though a wise man think to know it, yet shall he not be able to find it." [1] Why should it be one thing, in its effect upon the emotions, to say, "Patience is a virtue," and quite another thing, in its effect upon the emotions, to say with Homer,

τλητὸν γὰρ Μοῖραι θυμὸν θέσαν ἀνθρώποισιν — [2]

"for an enduring heart have the destinies appointed

1 Ecclesiastes, viii, 17.
2 *Iliad*, xxiv, 49.

to the children of men"? Why should it be one thing, in its effect upon the emotions, to say with the philosopher Spinoza, *Felicitas in ea consistit quod homo suum esse conservare potest* — "Man's happiness consists in his being able to preserve his own essence," and quite another thing, in its effect upon the emotions, to say with the Gospel, "What is a man advantaged, if he gain the whole world, and lose himself, forfeit himself?" How does this difference of effect arise? I cannot tell, and I am not much concerned to know; the important thing is that it does arise, and that we can profit by it. But how, finally, are poetry and eloquence to exercise the power of relating the modern results of natural science to man's instinct for conduct, his instinct for beauty? And here again I answer that I do not know *how* they will exercise it, but that they can and will exercise it I am sure. I do not mean that modern philosophical poets and modern philosophical moralists are to come and relate for us, in express terms, the results of modern scientific research to our instinct for conduct, our instinct for beauty. But I mean that we shall find, as a matter of experience, if we know the best that has been thought and uttered in the world, we shall find that the art and poetry and eloquence of men who lived, perhaps, long ago, who had the most limited natural knowledge, who had the most erroneous conceptions about many important matters, we shall find that this art, and poetry, and eloquence, have in fact not only the power of refreshing and delighting us, they have also the power,— such is the strength and worth, in essentials, of their authors' criticism of life,— they have a fortifying, and elevating, and quickening, and suggestive power, cap-

able of wonderfully helping us to relate the results of modern science to our need for conduct, our need for beauty. Homer's conceptions of the physical universe were, I imagine, grotesque; but really, under the shock of hearing from modern science that "the world is not subordinated to man's use, and that man is not the cynosure of things terrestrial," I could, for my own part, desire no better comfort than Homer's line which I quoted just now.

τλητὸν γὰρ Μοῖραι θυμὸν θέσαν ἀνθρώποισιν —

"for an enduring heart have the destinies appointed to the children of men"!

And the more that men's minds are cleared, the more that the results of science are frankly accepted, the more that poetry and eloquence come to be received and studied as what in truth they really are,— the criticism of life by gifted men, alive and active with extraordinary power at an unusual number of points;— so much the more will the value of humane letters, and of art also, which is an utterance having a like kind of power with theirs, be felt and acknowledged, and their place in education be secured.

. . . . . .

And therefore, to say the truth, I cannot really think that humane letters are in much actual danger of being thrust out from their leading place in education, in spite of the array of authorities against them at this moment. So long as human nature is what it is, their attractions will remain irresistible. As with Greek, so with letters generally: they will some day come, we may hope, to be studied more rationally, but they will not lose their place. What will happen will

rather be that there will be crowded into education other matters besides, far too many; there will be, perhaps, a period of unsettlement and confusion and false tendency; but letters will not in the end lose their leading place. If they lose it for a time, they will get it back again. We shall be brought back to them by our wants and aspirations. And a poor humanist may possess his soul in patience, neither strive nor cry, admit the energy and brilliancy of the partisans of physical science, and their present favor with the public, to be far greater than his own, and still have a happy faith that the nature of things works silently on behalf of the studies which he loves, and that, while we shall all have to acquaint ourselves with the great results reached by modern science, and to give ourselves as much training in its disciplines as we can conveniently carry, yet the majority of men will always require humane letters; and so much the more, as they have the more and the greater results of science to relate to the need in man for conduct, and to the need in him for beauty.

NOTE TO ESSAY XVII

The following paragraphs, from Arnold's Introduction to Ward's *English Poets,* make an interesting illustration and reinforcement of his idea of the relation of literature to science:

"'The future of poetry is immense, because in poetry, where it is worthy of its high destinies, our race, as time goes on, will find an ever surer and surer stay. There is not a creed which is not shaken, not an accredited dogma which is not shown to be questionable, not a received tradition which does not threaten to dissolve. Our religion has materialized itself in the fact, in the supposed fact; it has attached its emotion to the fact, and now the fact is failing it. But for poetry the idea is everything; the rest is a world of illusion, of divine illusion. Poetry attaches its emotion to the idea; the idea *is* the fact. The strongest part of our religion to-day is its unconscious poetry.'

"Let me be permitted to quote these words of my own, as uttering the thought which should, in my opinion, go with us and govern us in all our study of poetry. In the present work it is the course of one great contributory stream to the world-river of poetry that we are invited to follow. We are here invited to trace the stream of English poetry. But whether we set ourselves, as here, to follow only one of the several streams that make the mighty river of poetry, or whether we seek to know them all, our governing thought should be the same. We should conceive of poetry worthily, and more highly than it has been the custom to conceive of it. We should conceive of it

as capable of higher uses, and called to higher destinies, than those which in general men have assigned to it hitherto. More and more mankind will discover that we have to turn to poetry to interpret life for us, to console us, to sustain us. Without poetry, our science will appear incomplete; and most of what now passes with us for religion and philosophy will be replaced by poetry. Science, I say, will appear incomplete without it. For finely and truly does Wordsworth call poetry 'the impassioned expression which is in the countenance of all science'; and what is a countenance without its expression? Again, Wordsworth finely and truly calls poetry 'the breath and finer spirit of all knowledge': our religion, parading evidences such as those on which the popular mind relies now; our philosophy, pluming itself on its reasonings about causation and finite and infinite being; what are they but the shadows and dreams and false shows of knowledge? The day will come when we shall wonder at ourselves for having trusted to them, for having taken them seriously; and the more we perceive their hollowness, the more we shall prize 'the breath and finer spirit of knowledge' offered to us by poetry."

XVIII

Poetry and Science

By William Wordsworth [1]

TAKING up the subject, then, upon general grounds, let me ask, what is meant by the word Poet? What is a Poet? To whom does he address himself? And what language is to be expected from him? — He is a man speaking to men: a man, it is true, endowed with more lively sensibility, more enthusiasm and tenderness, who has a greater knowledge of human nature, and a more comprehensive soul, than are supposed to be common among mankind; a man pleased with his own passions and volitions, and who rejoices more than other men in the spirit of life that is in him; delighting to contemplate similar volitions and passions as manifested in the goings-on of the Universe, and habitually impelled to create them where he does not find them. To these qualities he has added a disposition to be affected more than other men by absent things as if they were present; an ability of conjuring up in himself passions, which are indeed far from being

1 These paragraphs are taken from Wordsworth's Preface to the *Lyrical Ballads*, a volume of poems which he published with Coleridge in 1798; the Preface appeared first in the second edition in 1800. William Wordsworth, 1770–1850, was, like many of the poets of his day who were exploring new fields of poetic thought and feeling, the author of several critical treatises in prose, explaining and defending his theories. Among many such works of extraordinary interest produced in this period, the Preface to the *Lyrical Ballads* is one of the best.— EDITOR.

the same as those produced by real events, yet (especially in those parts of the general sympathy which are pleasing and delightful) do more nearly resemble the passions produced by real events, than anything which, from the motions of their own minds merely, other men are accustomed to feel in themselves: — whence, and from practice, he has acquired a greater readiness and power in expressing what he thinks and feels, and especially those thoughts and feelings which, by his own choice, or from the structure of his own mind, arise in him without immediate external excitement.

But whatever portion of this faculty we may suppose even the greatest Poet to possess, there cannot be a doubt that the language which it will suggest to him, must often, in liveliness and truth, fall short of that which is uttered by men in real life, under the actual pressure of those passions, certain shadows of which the Poet thus produces, or feels to be produced, in himself.

However exalted a notion we would wish to cherish of the character of a Poet, it is obvious, that while he describes and imitates passions, his employment is in some degree mechanical, compared with the freedom and power of real and substantial action and suffering. So that it will be the wish of the Poet to bring his feelings near to those of the persons whose feelings he describes, nay, for short spaces of time, perhaps, to let himself slip into an entire delusion, and even confound and identify his own feelings with theirs; modifying only the language which is thus suggested to him by a consideration that he describes for a particular purpose, that of giving pleasure. Here, then, he will apply the principle of selection which has been already in-

sisted upon. He will depend upon this for removing what would otherwise be painful or disgusting in the passion; he will feel that there is no necessity to trick out or to elevate nature: and, the more industriously he applies this principle, the deeper will be his faith that no words, which *his* fancy or imagination can suggest, will be to be compared with those which are the emanations of reality and truth.

But it may be said by those who do not object to the general spirit of these remarks, that, as it is impossible for the Poet to produce upon all occasions language as exquisitely fitted for the passion as that which the real passion itself suggests, it is proper that he should consider himself as in the situation of a translator, who does not scruple to substitute excellencies of another kind for those which are unattainable by him; and endeavors occasionally to surpass his original, in order to make some amends for the general inferiority to which he feels that he must submit. But this would be to encourage idleness and unmanly despair. Further, it is the language of men who speak of what they do not understand; who talk of Poetry as of a matter of amusement and idle pleasure; who will converse with us as gravely about a *taste* for Poetry, as they express it, as if it were a thing as indifferent as a taste for rope-dancing, or Frontiniac or Sherry. Aristotle, I have been told, has said, that Poetry is the most philosophic of all writing: it is so: its object is truth, not individual and local, but general, and operative; not standing upon external testimony, but carried alive into the heart by passion; truth which is its own testimony, which gives competence and confidence to the tribunal to which it appeals, and receives

them from the same tribunal. Poetry is the image of man and nature. The obstacles which stand in the way of the fidelity of the Biographer and Historian, and of their consequent utility, are incalculably greater than those which are to be encountered by the Poet who comprehends the dignity of his art. The Poet writes under one restriction only, namely, the necessity of giving immediate pleasure to a human Being possessed of that information which may be expected from him, not as a lawyer, a physician, a mariner, an astronomer, or a natural philosopher, but as a Man. Except this one restriction, there is no object standing between the Poet and the image of things; between this, and the Biographer and Historian, there are a thousand.

Nor let this necessity of producing immediate pleasure be considered as a degradation of the Poet's art. It is far otherwise. It is an acknowledgment of the beauty of the universe, an acknowledgment the more sincere, because not formal, but indirect; it is a task light and easy to him who looks at the world in the spirit of love: further, it is a homage paid to the native and naked dignity of man, to the grand elementary principle of pleasure, by which he knows, and feels, and lives, and moves. We have no sympathy but what is propagated by pleasure: I would not be misunderstood; but wherever we sympathize with pain, it will be found that the sympathy is produced and carried on by subtle combinations with pleasure. We have no knowledge, that is, no general principles drawn from the contemplation of particular facts, but what has been built up by pleasure, and exists in us by pleasure alone. The Man of science, the Chemist and

Mathematician, whatever difficulties and disgusts they may have had to struggle with, know and feel this. However painful may be the objects with which the Anatomist's knowledge is connected, he feels that his knowledge is pleasure; and where he has no pleasure he has no knowledge. What then does the Poet? He considers man and the objects that surround him as acting and reacting upon each other, so as to produce an infinite complexity of pain and pleasure; he considers man in his own nature and in his ordinary life as contemplating this with a certain quantity of immediate knowledge, with certain convictions, intuitions, and deductions, which from habit acquire the quality of intuitions; he considers him as looking upon this complex scene of ideas and sensations, and finding everywhere objects that immediately excite in him sympathies which, from the necessities of his nature, are accompanied by an overbalance of enjoyment.

To this knowledge which all men carry about with them, and to these sympathies in which, without any other discipline than that of our daily life, we are fitted to take delight, the Poet principally directs his attention. He considers man and nature as essentially adapted to each other, and the mind of man as naturally the mirror of the fairest and most interesting properties of nature. And thus the Poet, prompted by this feeling of pleasure, which accompanies him through the whole course of his studies, converses with general nature, with affections akin to those, which, through labor and length of time, the Man of science has raised up in himself, by conversing with those particular parts of nature which are the objects of his studies. The knowledge both of the Poet and the Man

of science is pleasure; but the knowledge of the one cleaves to us as a necessary part of our existence, our natural and unalienable inheritance; the other is a personal and individual acquisition, slow to come to us, and by no habitual and direct sympathy connecting us with our fellow-beings. The Man of science seeks truth as a remote and unknown benefactor; he cherishes and loves it in his solitude: the Poet, singing a song in which all human beings join with him, rejoices in the presence of truth as our visible friend and hourly companion. Poetry is the breath and finer spirit of all knowledge; it is the impassioned expression which is in the countenance of all Science. Emphatically may it be said of the Poet, as Shakespeare hath said of man, "that he looks before and after." He is the rock of defense for human nature; an upholder and preserver, carrying everywhere with him relationship and love. In spite of difference of soil and climate, of language and manners, of laws and customs: in spite of things silently gone out of mind, and things violently destroyed; the Poet binds together by passion and knowledge the vast empire of human society, as it is spread over the whole earth, and over all time. The objects of the Poet's thoughts are everywhere; though the eyes and senses of man are, it is true, his favorite guides, yet he will follow wheresoever he can find an atmosphere of sensation in which to move his wings. Poetry is the first and last of all knowledge — it is as immortal as the heart of man. If the labors of Men of science should ever create any material revolution, direct or indirect, in our condition, and in the impressions which we habitually receive, the Poet will sleep then no more than at present; he will be ready

to follow the steps of the Man of science, not only in those general indirect effects, but he will be at his side, carrying sensation into the midst of the objects of the science itself. The remotest discoveries of the Chemist, the Botanist, or Mineralogist, will be as proper objects of the Poet's art as any upon which it can be employed, if the time should ever come when these things shall be familiar to us, and the relations under which they are contemplated by the followers of these respective sciences shall be manifestly and palpably material to us as enjoying and suffering beings. If the time should ever come when what is now called science, thus familiarized to men, shall be ready to put on, as it were, a form of flesh and blood, the Poet will lend his divine spirit to aid the transfiguration, and will welcome the Being thus produced, as a dear and genuine inmate of the household of man.— It is not, then, to be supposed that any one, who holds that sublime notion of Poetry which I have attempted to convey, will break in upon the sanctity and truth of his pictures by transitory and accidental ornaments, and endeavor to excite admiration of himself by arts, the necessity of which must manifestly depend upon the assumed meanness of his subject.

NOTE TO ESSAY XVIII

The following paragraph from Sir Frederick Pollock's Introduction to the *Lectures and Essays* of W. K. Clifford, makes an interesting parallel to Wordsworth's idea: "It is an open secret to the few who know it, but a mystery and a stumbling-block to the many, that Science and Poetry are own sisters; insomuch that in those branches of scientific inquiry which are most abstract, most formal, and most remote from the grasp of the ordinary sensible imagination, a higher power of imagination akin to the creative insight of the poet is most needed and most fruitful of lasting work. This living and constructive energy projects itself out into the world at the same time that it assimilates the surrounding world to itself. When it is joined with quick perception and delicate sympathies, it can work the miracle of piercing the barrier that separates one mind from another, and becomes a personal charm. It can be known only in its operation, and is by its very nature incommunicable and indescribable. Yet this faculty, when a man is gifted with it, seems to gather up the best of his life, so that the man always transcends every work shapen and sent forth by him; his presence is full of it, and it lightens the air his friends breathe; it commands, not verbal assent to propositions or intellectual acquiescence in arguments, but the conviction of being in the sphere of a vital force for which nature must make room."

XIX

The Liberal Education of the Nineteenth Century

By William P. Atkinson [1]

THE collapse of that classical system of liberal education which has held almost undisputed sway since the revival of learning in the sixteenth century, and the now generally recognized insufficiency of the theory which makes the study of the languages of Greece and Rome the sole foundation of the higher education, are leading, as all familiar with the educational thought of the present day are aware, to the greatest variety of speculations as to the system which is destined to supersede it. That a theory of liberal education as well adapted to the wants of the nineteenth — or, shall we not rather say the twentieth — century, as was the classical theory to the wants of the sixteenth, has yet been elaborated, would be quite too much to affirm.

1 This paper was read by Professor Atkinson before the National Teachers' Association at Elmira, New York, in August, 1873, and printed in the *Popular Science Monthly* in November of that year: it is used here by permission of the editor, Professor J. McK. Cattell. Professor Atkinson's voluminous footnotes have been omitted from this reprint.

William Parsons Atkinson, 1820–1890, was Professor of English in the Massachusetts Institute of Technology from 1868 to 1889. He had a classical education at Harvard and taught classics before his appointment at the Institute of Technology. He published several papers on the relation of classical to scientific and English studies: these essays show that his work, though hampered by lack of time and of books and of assistants, was based upon a lofty and independent conception of the function of English in a technical education.— EDITOR.

We are living in the midst of a chaos of conflicting opinions, and it seems to be the duty of all who think at all on a subject on which the vital interests of the future so much depend, and especially incumbent on all practical teachers to make such contribution as they are able, from their studies and reflection or their experience, toward the right solution of the problem. It is to such a contribution that I now ask your attention.

I begin with a definition of Liberal Education, in regard to which I presume we shall not be much at variance. The term liberal is opposed to the term servile. A liberal education is that education which makes a man an intellectual freeman, as opposed to that which makes a man a tool, an instrument for the accomplishment of some ulterior aim or object. The aim of the liberal education of any period is the right use of the realized capital of extant knowledge of that period, for the training of the whole, or only of some privileged part of the rising generation, to act the part and perform the duties of free, intellectual, and moral beings. So far as the nature of the human mind and the foundations of human knowledge remain the same from age to age and generation to generation, a liberal education is the same thing in every age and generation; so far as the condition of society varies from age to age, and as the accumulated capital of extant knowledge increases, the liberal education of one generation will differ from that of another. There are, therefore, both constant and variable factors in our problem. It is with the variable factors, as modifying our conception of the liberal education of the nineteenth century, that I have here chiefly to do.

I reckon five leading influences which are acting powerfully to modify all our old theories, and slowly working out a new ideal of liberal education: (1) A truer psychology, giving us for the first time a true theory of elementary teaching. (2) Progress in the science of philology, enabling us to assign their right position to the classical languages as elements in liberal culture, and giving us, in modern philological science, an improved and more powerful teaching instrument. (3) The first real attempt to combine republican ideas with the theory of liberal education — in other words, to make the education of the whole people liberal, instead of merely the education of certain privileged classes and protected professions. And when I say the whole people, I mean *men and women*. Nothing, I will say in passing, to my mind so marks us as still educational barbarians, so stamps all our boasted culture with illiberality, as an exclusion of the other sex from all share in its privileges. No education can be truly liberal which is not equally applicable to one sex as to the other. (4) As the influence more profoundly modifying our conceptions of liberal education than any other, I reckon the advent of modern physical science. (5) I count among those influences the growing perception that art and æsthetic culture are equally necessary as an element in all education worthy of the name.

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Let me pass to the second influence, which is acting powerfully to modify all our previous conceptions of the subject; I mean the progress of modern linguistic science. I take this next in order because, contrary to the current of thought prevailing at the present

moment, I believe the old doctrine will still be found to hold true, even after physical science shall have at last found its true place in the new education, that the study of that wonderful world of matter, which is the stage on which man plays his earthly part, wonderful as it is, is yet inferior in dignity and importance to the study of the being and doing of the actor who plays his part thereon. Scientific studies, though for the time being in the ascendant, yet, even when all their rights shall be accorded to them, will, in a well-balanced system, take their place a little below ethical studies. This, I say, as not believing in the current materialistic philosophy in any of its forms, but as being an immaterialist, as I must phrase it, since we have been robbed by unworthy and degrading associations of the word spiritualist. But, without raising any question of precedence between branches of study which are both essential to any true conception of a complete education, let me proceed to point out that the progress of linguistic science and of modern literature has totally transformed the educational character and position of the ethical studies of which they are the instrument and the embodiment. When the Revival of Learning gave birth to the present classical system of literary, or, as I have termed it, ethical liberal study, it did so by putting into the hands of scholars not merely two grammars as instruments of youthful mental discipline, as the advocates of the grindstone-system would fain have us believe, but two languages that unlocked the stores of a whole new world of ethical thought, in the shape of the philosophy, the history, and the poetry contained in Greek and Roman literature. How assiduously those literatures were

studied, how they leavened the whole thought of Europe, and mightily contributed to disperse the intellectual darkness and break the bonds of the spiritual despotism of the mediæval Church, we all know. Classical philosophy, history, poetry, and art, nourished the European mind, and were almost the sole foundation of its culture, through all the period during which the Latin and Teutonic races of Western Europe were slowly elaborating languages and literatures of their own. They were thus of necessity the main instrument of culture of the schools during the period when, save the obsolete scholastic philosophy, no other instrument was forthcoming; and I do not think it possible to overrate the debt which Western Europe owes to them. But gradually their educating influence has been absorbed, and in great measure exhausted, while partially, but by no means wholly, out of the nutriment they furnished have sprung the national languages and literatures which, as more and not less powerful educating instrumentalities, are to supersede them. It is to ignore the vast progress of the human mind since the days of Erasmus to try any longer to make classical learning stand in the same relation to the modern student that it stood in to Erasmus: and Erasmus, if he were alive to-day, would be the first to abandon the dead pedantries of the past for the fountains of new thought he would see flowing all round him.

When I say, then, that I think the languages and literatures of Greece and Rome are soon to be abandoned, as the sole or main instruments of that side of liberal culture which I have preferred to call ethical rather than literary, it is not that I do not fully recog-

nize their value and beauty, or the vast service they have done in emancipating and training the mind of Western Europe: it is not that I do not recognize their value as among the specialties of liberal culture now. It is only as the sole or chief instruments of literary school training that I believe them to be superseded. So far from believing that they will be abandoned, I believe they will be more diligently and successfully studied in the future, when they will be left as a specialty in the hands of that small number of students who, at any time, in this modern world of ours, will of their own free choice pursue them. As a specialty for the few, classical studies still have a future before them, and we can ill afford to lose the elevating and refining influence exercised by their real votaries on those who do not directly pursue them; but as the main instruments of liberal culture their day seems to me to be nearly over.

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Thus it is that, classical education having dwindled into a shadow, our colleges are looking about for a remedy, and a class of thinkers, just now, as we know, very influential, are looking to the substitution of the study of science as the sole remedy. Gentlemen, I have been long enough attached to a school of science to have been convinced, if I had ever doubted it, that science by itself is no remedy; that as there can never again be a liberal education, or the pretense of one, without the scientific element, so on the other hand, scientific studies alone can never constitute a liberal education — scientific can never supersede ethical studies as its foundation. What, then, is the true remedy? I think it is evident. It is, along with

scientific study, of whose true place I shall have more to say presently, to accept ethical studies in their new form, in the form of modern literatures and modern languages, and with classical studies as the special and subordinate, and not, as heretofore, the main and primary instrument. This is the great change which liberal education is silently undergoing, far more than it is a change from a literary to a scientific basis.

I know of no educational fallacy more common and more mischievous than that of enormously overrating the educating value of the process of acquiring the mere form of foreign languages, whether dead or living; yet it is in this barren study that we waste the precious time that should be employed, from the very beginning of school-life, in acquiring the substance of real knowledge. Languages, other than our own, are the useful, sometimes the necessary tools for acquiring knowledge; in the literatures of other tongues there reside elements of culture not to be found, or not to be found in the same perfection in our own, which may well repay the student who has time and perseverance sufficient really to attain them without too great a sacrifice. But to sacrifice an attainable education in *not* attaining them, what is it but to sow the barren seashore, to travel half a journey, to possess one's self of half an instrument useless without the other half. . . .

I think that we monstrously overrate the educating value of the mere process of learning other languages; but with the mother-tongue the case is altogether different. Here the mastery of form and substance can proceed *pari passu*. The mother-tongue is the only one which can stand to our modern liberal education in the relation in which the classical tongues stood to the

scholars of the revival of learning. It might be said that Greek and Latin were mother-tongues to them as scholars, because it was through them alone that they reached the *thoughts* which really educated them. They were not brought up on empty words and barren syntax; they studied no grammars, for grammars were non-existent. Their minds were really nourished on the philosophy of Plato, and Cicero's eloquence, and Homer's poetry, and the lessons, not the words, they found in Tacitus and Thucydides. Now, when we have a philosophy, a history, a poetry, a law, an ethics, which embody all that is valuable in classical literature, together with all the progress of thought has produced through these later centuries, we not only fail to use them as those older scholars used their older instruments, really and efficiently, but we equally fail in using the older ones. We abandon both to feed our boys on a husk without a kernel. What wonder that our higher education is struck with barrenness!

When, therefore, I propose modern language-study instead of ancient, as a chief instrument of school education, I mean much more than the mere substitution of the study of some modern language as language, for some ancient language as language — German, for instance, instead of Greek, as has sometimes been suggested. This would be the mere semblance of a remedy, for the difficulty consists in the enormous overrating, by what I have called the grindstone-theory, of the educating value of the study of the mere structure and vocabulary of any strange language whatever. It has sometimes been doubted if we can ever really know more than one tongue, and certainly all our deeper mental processes go on in that one we know best. If

that is a foreign one, it is because we have lost a mother to gain a step-mother; and a step-mother she will ever remain. What is very certain is, that too many of the recipients of our present education, in seeking to possess themselves of more than one language, end with having none whatever. Neglecting to develop their minds through the instrumentality of their mother-tongue, and never, therefore, really knowing it, they equally fail in providing themselves with any substitute; with Shakespeare's pedants, "they have been at a great feast of languages, and stolen the scraps."

My position, therefore, is that, so far as language-study shall form a part of the elementary discipline of the liberal education of the future, the centre and pivot of it all will hereafter be the scientific study of the mother-tongue. . . . But far above and beyond its uses as language-study comes the advantage of the direct and immediate entrance it gives to those regions of thought in which the higher mental discipline really lies. Through the direct road of the real study of the mother-tongue, and that rhetorical, and, above all, that real logical study which accompanies and forms a part of it, can the study of what we vaguely denominate literature, and that which we are beginning still more vaguely to denominate social science, but which yet, between them, contain the substance of all we most need to know of man as distinct from Nature, be made real portions of general knowledge — be transferred from being a possession in the hands of the few, to be reached only by an abstruse and difficult preparatory training, secrets unlocked by a key out of reach of the hands of the many, to being a part of the general in-

heritance of all men. For, to be so, they must be made primary and not secondary; in other words, that time and strength must be devoted to a fruitful study of modern thought and modern literature, which have heretofore been wasted in school and college on the futile attempt to master ancient thought and ancient literature. The rudiments of all those studies must be reckoned as the most valuable . . . which in their higher departments . . . form the substance of professional knowledge, both that of those professions now reckoned, and of all those hereafter to be reckoned liberal. For, what should liberal education be but the preparatory general stage for that work of life which all honest callings and professions carry on in diverse directions afterwards? What is a professional education but a liberal education taking a special direction?

Can it now be said, with any truth, that our nominally educated young men go out into the world equipped with that general knowledge of the sciences of law and government, and political economy, with that knowledge of ethics and philosophy, with that acquaintance with modern history and of the condition of the world they live in, and with that real taste for modern literature, which should form the equipment of every man calling himself educated? We shall have to give a negative answer, just so long as we do not look upon all these as the truly disciplinary studies, and the elements of all these as the true elementary studies, the very school-studies fitted, above all others, for maturing the youthful mind, and filling it with true wisdom. So long as we insist upon approaching them through the operose and roundabout method of dead-language studies, school-days will flee away, and the

object will *not* be accomplished. The great vice of our education, as has been well said, is its indirectness.

Combining the ideas which I have thus presented — (1) that the study of foreign languages as languages, whether dead or living, holds a place in our present education-philosophy quite out of proportion to its real value and importance, and that it is the discipline of philosophy which we are indirectly aiming at, behind and through the discipline of language; (2) that it is through one tongue and not many that that discipline can best be imparted, inasmuch as that is the only one that can or will ever, by the majority of men, be really mastered; and, (3) that now, for the first time, there is the possibility, through the progress of modern linguistic science, of a scientific and systematic study of the mother-tongue — I arrive at the conclusion that we are presently to have, as a substitute for the exclusive or almost exclusive use of classical languages and literatures, as the main disciplinary element in liberal education, a systematic study of the English language and a recognition of its literature as primary, not secondary. . . .

That . . . brings me to my next point, and the third new ingredient in the liberal education of the future, the element contributed by republicanism. I have said that the science of education was still in its infancy; I believe that it is only as a part of republican institutions that it can reach maturity. For the only true liberal education is the education of man as man; the only truly liberal system is that which can be applied to a whole nation, and such a system is only possible as a part of republican institutions. And, when we consider how short a time we have been

living under them, and how crude and imperfect they still are, it is not strange that they have not yet produced what will be rather one of their maturest than one of their earliest fruits, a truly liberal education-system.

The history of our errors in regard to liberal education is a very plain one. They are the legacy of the mother-country from which we came, a mother-country which is just beginning to correct her own errors, even by the light of our limited experience. I wish to point out and emphasize the fact that republicanism revolutionizes our very conception of liberal education. All forms of liberal education of the past, and pre-eminently the one we borrowed from England, were forms of exclusive class-education. The idea of caste was involved in their very conception, to such a degree that the phrase, the liberal education of the people, was a contradiction in terms. The antithesis was, popular *versus* liberal education. There was the illiberal or servile education of the masses, designed to fit them for the humble station in which it had pleased Providence to place them, and to content them therewith; there was the liberal education of the exclusive learned professions, and the exclusive aristocratic class, which was liberal by virtue of its being the education of the rulers and not the ruled. Now, republicanism, by converting the people into rulers, transfers to them the claim to a liberal education, which shall be universal. A transfer of the power alone, without a transfer of the privilege and the opportunity necessary to prepare for the exercise of it, cannot but be disastrous. If republicanism is to remain republicanism, and not degenerate into oligarchy or plutocracy,

or end in anarchy, there must be one homogeneous education-system for all, and that one the highest attainable. The line of demarcation between liberal and illiberal must be obliterated, and what cannot be called liberal will be seen to be no education at all, but only a miserable counterfeit, by which privileged classes strive to perpetuate obsolete distinctions and indefensible abuses. For a republic, there can be but one system, and one set of schools; its education, begun on the lowest benches of its national primary schools, will one day be completed in the halls of its national universities. There will be no question as to the relative dignity of protected and unprotected professions, or callings, or classes, but all will be reckoned liberal which train and educate the faculties of man as man.

Now, the only conception of a liberal education that will satisfy these new conditions, the only conception of an education capable of becoming national and universal, at the same time that it is liberal, is that of a training of the national mind through the mother-tongue as the chief, and other tongues as the subordinate instruments, in the elements of all those branches of knowledge which, used in their rudiments as elements of general training, will develop, in their higher stages, into the objects of professional pursuits. Is there any other distinction than this between general and professional? In the infancy of knowledge, all callings, trades, and professions, are mysteries, whose secrets are carefully guarded from the uninitiated. Every mechanic belongs to his trade-guild, and has his trade-secrets. When Philip of Burgundy destroyed the little town of Dinant, in the Low Countries, the art of making copper vessels became, for the time being,

a lost art. With the progress of general intelligence mystery falls away from simpler occupations, but still attaches to what are called the learned professions. The layman has nothing to do with the study of the science of theology: that must be expounded to him by his priest. The layman has nothing to do with the science of medicine: he must be cured, or, more probably, killed, *secundum artem,* by his physician. The layman has nothing to do with the science of the law: it is his business to get into lawsuits, and it is the lawyer's secret how to extricate him. But these superstitions, the relics of an age of popular ignorance, are in their turn disappearing, as just ideas of what constitutes real knowledge begin to penetrate the minds of the whole people. It is seen that, so far from being mysterious, such knowledge is the very substance and material of sound education for all men; and the layman will no longer allow himself to be led blindfold by priest, or lawyer, or physician, for there is no longer any magical sacredness in their callings. And thus it comes about that a knowledge of physiology, which will help save the patient from any need of a physician; a knowledge of law, that shall obviate the necessity for lawsuits; a knowledge of political science and history worthy of men who have become their own rulers; a knowledge of political economy, that shall raise the honorable calling of the merchant to the dignity of a liberal profession; a knowledge of theology that shall save us the degrading spectacle of the unchristian quarrels of bigoted and superstitious sects — are reckoned more and more to be essential elements in *all* education. It is only on sound general knowledge, disseminated through the whole people by a

liberal education of the whole people, that we shall ever build up professions, in regard to which we are not forced to entertain a doubt as to whether they are not on the whole more of a curse to us than a blessing. And an education of this sort must be begun in the primary school, must have for its instrument the mother-tongue. It cannot be based on the study of Greek particles, or any amount of skill, either in the reading or the manufacture of Latin verses.

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I come now to the study of Physical Science, as from this time forward destined to play a wholly new part in our system of liberal education. . . . I am far from believing that its true place, as a factor in the new education, has yet been determined. While, on the one hand, among the old high-and-dry advocates of the grindstone-system, certain merits and a subordinate place are beginning to be grudgingly allowed it, we are in danger, on the other hand, in this new country of ours, whose vast material resources are waiting for development through its instrumentality, rather of overrating than underrating its purely educational function. It is not as an economical instrument for the development of material wealth that I have here to deal with it, though that is a very important aspect, but considered as a factor in a system of education, and, as such, I claim for it no monopoly, but only a place as the indispensable complement to those ethical and linguistic studies which have heretofore monopolized the title of a liberal education, and which, from the absence of science from that form of education, have been reduced to their present effete and impotent condition. It is to the

incorporation into it of the study of science that we are to look as the source of new life-blood.

You will not expect me to attempt to deal here with the great subject which forever occupies the minds of speculative thinkers, and never more than at the present moment — the true relations of the world of matter and the world of mind. That is too large a subject to be dealt with, though upon right views regarding it will greatly depend the correctness even of our educational theories. I will only say, that though I am as far as possible from being an adherent of any form of materialism, yet I believe that physical science is destined to be the great instrument of these modern days to give new forms to our philosophy and our theology — to give new forms to the same everlasting problems, but not to give us new philosophy or new theology. It will but cast old truths in new moulds, while it explodes old superstitions by adding new truths to the old ones. Our conservatives may spare their anxieties. Not a truth the world gains is ever lost again; but they who, blindly believing they have all truth, oppose the new form which science is giving to all knowledge, will soon find themselves side by side with those old Dunsemen who could not believe in the last revival of learning.

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If the study of modern science did not call for the exercise of all the highest faculties of man; if it did not give an exercise such as no other study gives to his reasoning as well as his observing powers; if without it the very study of language itself did not become empty and barren; if a knowledge of it were not necessary to the solution of all the profoundest philosoph-

ical problems with which the mind of man in these generations is occupied — then, indeed, a question might be raised as to the propriety of its introduction into the curriculum of liberal study. But if it is this, and more than all this, then it claims more than a subordinate place; it is no toy for idle hours, no subject to fill up gaps and intervals of time. It claims a right to no less than a full half of all available time and power; of time for training the student's senses — all left by our older training in worse than Egyptian darkness — of power to be employed in training the reasoning faculties, by processes as rigorous as any the older studies can boast of. Nothing less than this will satisfy the demands of science as an element in modern liberal education.

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But the chief influence of modern science upon liberal education will be its ethical influence. Its discoveries are transforming man's conception of the earth he lives on, and of his history and his work upon it. Before man acquires the control of matter, through ascertainment of the laws that govern it, his life on earth is poor, narrow, and full of hardship, and his earthly relations full of pain. So long as that state continues, life on earth must seem to him a small matter, and its opportunities for growth not much worth considering; it is only here and there that a philosopher in his closet attains to some realization of the capacities that lie hidden in it. War and savage occupations consume the days of the mass of men, and no culture is possible save the perverted culture of the cloister. But the advent of physical science means the emancipation of the masses into the privileges of intellectual life. From

a battle-ground, the earth is transformed into a school-room, written all over with hieroglyphics, no longer mysterious, but to which mankind have found the key: and, with the right use of the secrets thus unfolded, will come to the mass of men that accession of material wealth which will give the leisure and opportunities that have heretofore been the monopoly of privileged classes.

It is not wonderful that men, at first, are carried away with the contemplation of its lower uses, even sometimes to the making them the sole end of education. It is but a reaction from the opposite extreme, only a dazzling of eyes with a flood of new light. Presently we shall look about us, and find the old relations of things not greatly altered. Matter is not going to supplant mind because we are learning so much more about it; whether we understand or do not understand the laws that govern it, matter remains the servant of mind, to educate it and do its bidding. The higher uses of science will still be spiritual uses. It has not come into the world merely to carry us faster through space, merely that we may sleep more softly and eat and drink more luxuriously, nor will education become the mere teaching how to do these things. It is with the spiritual educating function alone that we have to deal when we consider it as an element in liberal education.

And thus one great result of the new form into which modern science is casting all our conceptions of education will be a vastly higher estimate of the educating value of those pursuits in life which are concerned with material things, and a distinct recognition of them as included among the liberal professions. It is inter-

esting to observe how the list of liberal professions enlarges with the advance of civilization. At first the priest is the divinely-appointed monopolist of all higher knowledge; by degrees he is joined by the lawyer, as the interpreter still of a divinely-established code; it is much later and only after a certain amount of progress has been made in physical knowledge that the importance of his function raises the physician's art to the dignity of a liberal profession; and that more at first through a superstitious belief in the power of his spells and his magic than from respect to the small reality of his science. Now that science has so far entered into other callings as to make them worthy fields for the exercise of the highest faculties, all those pursuits which have for their aim the improvement of man's earthly condition will take their due rank in the list of liberal professions, and the chemist, the engineer, the architect, and the merchant, will have their appropriate liberal educations as much as the clergyman, the lawyer, or the physician. It may safely be affirmed that that view of earthly life of mediæval ascetics which has left its traces so deeply imprinted in much of our sectarian theology is fast vanishing like an ugly dream forever. The intellectual and moral aspect of material pursuits is fast gaining, through the significance given to them by modern science, a predominance over their mere material aspect. The worker in material things is more and more, as the days go by, compelled to be an intellectual being even in order to be a worker, and it is because the study of and working in material things now give scope for the energies of great intellects, that they more and more absorb them. Whoever continues to believe in the

antithesis between matter and spirit, and insists upon looking on the world of material things as of necessity the world of the devil, must see in this tendency only disaster to all our higher interests; but whoever sees that it is the true function of modern science to spiritualize material things by enabling us to put them to higher uses, will see in science not the great antagonist but the great hope of the religion and the philosophy of the future.

The advocates of the classical theory are never weary of reproaching their opponents with opinions which, as they say, degrade the dignity of true learning, by making it subservient to mere utilitarian aims. If to try by knowledge to make this world a better place to live in, and to teach men how to make the highest and best use of it be utilitarianism, then I make bold to say that any knowledge that cannot make good its claim to such usefulness is worse than utilitarian, for it is useless knowledge. The charge that is meant to be brought is this, that none but the advocates of classical learning have or can have the higher ends of life in view in planning schemes of education; that all other systems look solely to the stomach or the pocket. I do not know whether such charges are not too hackneyed to waste words on; certainly I can conceive of no lower form of utilitarian abuse of education than the pursuit of fellowships by the cramming of Greek and mathematics for the competitive examinations of an English university. On the other hand, the truly liberal learning of England is to be found more than anywhere else at this moment with that noble band of students of science who are virtually excluded from all such preferments. It is not a difference in studies that con-

stitutes them liberal or illiberal; it is a difference in the spirit in which all studies may be pursued. The study of chemistry and the study of Greek particles may be equally base or equally noble, according as they are pursued worthily or unworthily, with a selfish eye to the loaves and fishes, or with an aim at the higher rewards of true culture, and the higher advancement of man's estate. But I think we may well leave aside this stupid charge of utilitarianism. It comes nowadays only from those benighted pedants who are wholly ignorant of the true spirit of modern science.

I have left myself no room, even if I were competent, to speak of the last ingredient in any just scheme of modern liberal education — the study of art, æsthetic culture. I fear there will be abundance of time to develop that side of the question in this country before it is in any danger of becoming a practical one. Yet, in the shape of elementary drawing, the rudiments of art are beginning to take their proper place in our schools as a necessary and indispensable element of all real education, and the art galleries and the foreign musicians of a few of our older cities are beginning to exert their influence, if a slight one, in introducing higher ideas of the importance of art into our new country. They will have but a limited influence, however, till the study of the fine arts takes its proper place among us as a necessary element in every conception of true education.

There is one form of art-study, and that, perhaps, the highest, which is open to all, even to the humblest student, and the most elementary school, and that is the study of poetry. It is a prime element in any conception of a liberal education, which shall take as

its chief instrument of language-training the mother-tongue, that the real study of English poetry will take the place of the pretended study of classical poetry. When that time comes, we may expect to see the great poets of our native tongue exerting the same influence in the culture and training of our children that Homer and Æschylus really exercised over that of the Greeks. We shall not know what that influence is capable of becoming till we have a *real* study of English, in place of a sham study of classical literature. The great Greek philosopher says that poetry is truer than history. Sure I am that we shall one day come to see that in neglecting to train and cultivate the imagination, we are neglecting the most powerful of all the faculties.

Ladies and gentlemen, I have thus given you, very feebly and imperfectly, an outline of a scheme of liberal education, applicable to a whole free people, which shall use that people's own language on the one hand, and the great instrument of modern science on the other, as its chief disciplinary instruments, in lieu of the obsolescent scheme for a liberal class education, based upon the study of dead languages as its chief educating instrument. As a means for realizing that scheme for the liberal education of the whole people, I believe that we must sooner or later have in this our republic one homogeneous system of free schools, from the lowest to the highest. The first step of that education will be taken from the benches of the primary school, its last lessons learned in the lecture-rooms and laboratories of universities, free from all trammels of sectarian narrowness or class distinctions. It will be from first to last a homogeneous, logically compacted, con-

sistent training in all available knowledge, to all attainable wisdom, free to all men and all women to pursue to the extent the faculties God has endowed them with will carry them. It is a Utopian vision, you will say, this of popular liberal education. Say rather it is the necessary safeguard and supplement of free institutions; to despair of it is to despair of the republic.

XX

Books Which Have Influenced Me

By Robert Louis Stevenson [1]

THE Editor has somewhat insidiously laid a trap for his correspondents, the question put appearing at first so innocent, truly cutting so deep. It is not, indeed, until after some reconnaissance and review that the writer awakes to find himself engaged upon something in the nature of autobiography, or, perhaps worse, upon a chapter in the life of that little, beautiful brother whom we once all had, and whom we have all lost and mourned, the man we ought to have been, the man we hoped to be. But when word has been passed (even to an editor), it should, if possible, be kept; and if sometimes I am wise and

1 "Books Which Have Influenced Me" was printed first in the *British Weekly*, May 13, 1887, and later in the same year it was included in a volume with articles by various other men on the same topic. It is printed in current editions of Stevenson's works in the volume *Essays in the Art of Writing*, and is reproduced here by permission of Charles Scribner's Sons, Publishers.

Robert Louis Stevenson, 1850–1894, was the son and grandson of two well known light-house engineers in Scotland. Stevenson loved himself an active out-door life and intended to be an engineer, but his health proved too delicate, and, after a half-hearted attempt to study law, he took up the profession of letters. He was always a traveller, he tried many climates in search of health, and in 1890 he settled in Samoa in the Pacific Ocean, where he lived the rest of his life. His novels and essays are well known and rightly admired, but nothing in them is finer than the courage and cheerfulness with which he fought the long fight against disease which made up his life.—EDITOR.

say too little, and sometimes weak and say too much, the blame must lie at the door of the person who entrapped me.

The most influential books, and the truest in their influence, are works of fiction. They do not pin the reader to a dogma, which he must afterwards discover to be inexact; they do not teach him a lesson, which he must afterwards unlearn. They repeat, they rearrange, they clarify the lessons of life; they disengage us from ourselves, they constrain us to the acquaintance of others; and they show us the web of experience, not as we can see it for ourselves, but with a singular change — that monstrous, consuming *ego* of ours being, for the nonce, struck out. To be so, they must be reasonably true to the human comedy; and any work that is so serves the turn of instruction. But the course of our education is answered best by those poems and romances where we breathe a magnanimous atmosphere of thought and meet generous and pious characters. Shakespeare has served me best. Few living friends have had upon me an influence so strong for good as Hamlet or Rosalind. The last character, already well beloved in the reading, I had the good fortune to see, I must think, in an impressionable hour, played by Mrs. Scott Siddons. Nothing has ever more moved, more delighted, more refreshed me; nor has the influence quite passed away. Kent's brief speech over the dying Lear had a great effect upon my mind, and was the burthen of my reflections for long, so profoundly, so touchingly generous did it appear in sense, so overpowering in expression. Perhaps my dearest and best friend outside of Shakespeare is D'Artagnan — the

elderly D'Artagnan of the *Vicomte de Bragelonne.* I know not a more human soul, nor, in his way, a finer; I shall be very sorry for the man who is so much of a pedant in morals that he cannot learn from the Captain of Musketeers. Lastly, I must name the *Pilgrim's Progress,* a book that breathes of every beautiful and valuable emotion.

But of works of art little can be said; their influence is profound and silent, like the influence of nature; they mould by contact; we drink them up like water, and are bettered, yet know not how. It is in books more specifically didactic that we can follow out the effect, and distinguish and weigh and compare. A book which has been very influential upon me fell early into my hands, and so may stand first, though I think its influence was only sensible later on, and perhaps still keeps growing, for it is a book not easily outlived: the *Essais* of Montaigne. That temperate and genial picture of life is a great gift to place in the hands of persons of to-day; they will find in these smiling pages a magazine of heroism and wisdom, all of an antique strain; they will have their "linen decencies" and excited orthodoxies fluttered, and will (if they have any gift of reading) perceive that these have not been fluttered without some excuse and ground of reason; and (again if they have any gift of reading) they will end by seeing that this old gentleman was in a dozen ways a finer fellow, and held in a dozen ways a nobler view of life, than they or their contemporaries.

The next book, in order of time, to influence me, was the New Testament, and in particular the Gospel according to St. Matthew. I believe it would startle

and move any one if they could make a certain effort of imagination and read it freshly like a book, not droningly and dully like a portion of the Bible. Any one would then be able to see in it those truths which we are all courteously supposed to know and all modestly refrain from applying. But upon this subject it is perhaps better to be silent.

I come next to Whitman's *Leaves of Grass,* a book of singlar service, a book which tumbled the world upside down for me, blew into space a thousand cobwebs of genteel and ethical illusion, and, having thus shaken my tabernacle of lies, set me back again upon a strong foundation of all the original and manly virtues. But it is, once more, only a book for those who have the gift of reading. I will be very frank — I believe it is so with all good books except, perhaps, fiction. The average man lives, and must live, so wholly in convention, that gunpowder charges of the truth are more apt to discompose than to invigorate his creed. Either he cries out upon blasphemy and indecency, and crouches the closer round that little idol of part-truths and part-conveniences which is the contemporary deity, or he is convinced by what is new, forgets what is old, and becomes truly blasphemous and indecent himself. New truth is only useful to supplement the old; rough truth is only wanted to expand, not to destroy, our civil and often elegant conventions. He who cannot judge had better stick to fiction and the daily papers. There he will get little harm, and, in the first at least, some good.

Close upon the back of my discovery of Whitman, I came under the influence of Herbert Spencer. No

more persuasive rabbi exists, and few better. How much of his vast structure will bear the touch of time, how much is clay and how much brass, it were too curious to inquire. But his words, if dry, are always manly and honest; there dwells in his pages a spirit of highly abstract joy, plucked naked like an algebraic symbol but still joyful; and the reader will find there a *caput mortuum* of piety, with little indeed of its loveliness, but with most of its essentials; and these two qualities make him a wholesome, as his intellectual vigor makes him a bracing, writer. I should be much of a hound if I lost my gratitude to Herbert Spencer.

Goethe's Life, by Lewes, had a great importance for me when it first fell into my hands — a strange instance of the partiality of man's good and man's evil. I know no one whom I less admire than Goethe; he seems a very epitome of the sins of genius, breaking open the doors of private life, and wantonly wounding friends, in that crowning offence of *Werther,* and in his own character a mere pen-and-ink Napoleon, conscious of the rights and duties of superior talents as a Spanish inquisitor was conscious of the rights and duties of his office. And yet in his fine devotion to his art, in his honest and serviceable friendship for Schiller, what lessons are contained! Biography, usually so false to its office, does here for once perform for us some of the work of fiction, reminding us, that is, of the truly mingled tissue of man's nature, and how huge faults and shining virtues cohabit and persevere in the same character. History serves us well to this effect, but in the originals, not in the pages of the popular epitomiser, who is bound, by the very nature of his task, to make us feel the difference of epochs instead

of the essential identity of man, and even in the originals only to those who can recognise their own human virtues and defects in strange forms, often inverted and under strange names, often interchanged. Martial is a poet of no good repute, and it gives a man new thoughts to read his works dispassionately, and find in this unseemly jester's serious passages the image of a kind, wise, and self-respecting gentleman. It is customary, I suppose, in reading Martial, to leave out these pleasant verses; I never heard of them, at least, until I found them for myself; and this partiality is one among a thousand things that help to build up our distorted and hysterical conception of the great Roman Empire.

This brings us by a natural transition to a very noble book — the *Meditations* of Marcus Aurelius. The dispassionate gravity, the noble forgetfulness of self, the tenderness of others, that are there expressed and were practised on so great a scale in the life of its writer, make this book a book quite by itself. No one can read it and not be moved. Yet it scarcely or rarely appeals to the feelings — those very mobile, those not very trusty parts of man. Its address lies further back: its lesson comes more deeply home; when you have read, you carry away with you a memory of the man himself; it is as though you had touched a loyal hand, looked into brave eyes, and made a noble friend; there is another bond on you thenceforward, binding you to life and to the love of virtue.

Wordsworth should perhaps come next. Every one has been influenced by Wordsworth, and it is hard to tell precisely how. A certain innocence, a rugged

austerity of joy, a sight of the stars, "the silence that is in the lonely hills," something of the cold thrill of dawn, cling to his work and give it a particular address to what is best in us. I do not know that you learn a lesson; you need not — Mill did not — agree with any one of his beliefs; and yet the spell is cast. Such are the best teachers; a dogma learned is only a new error — the old one was perhaps as good; but a spirit communicated is a perpetual possession. These best teachers climb beyond teaching to the plane of art; it is themselves, and what is best in themselves, that they communicate.

I should never forgive myself if I forgot *The Egoist*. It is art, if you like, but it belongs purely to didactic art, and from all the novels I have read (and I have read thousands) stands in a place by itself. Here is a Nathan for the modern David; here is a book to send the blood into men's faces. Satire, the angry picture of human faults, is not great art; we can all be angry with our neighbor; what we want is to be shown, not his defects, of which we are too conscious, but his merits, to which we are too blind. And *The Egoist* is a satire; so much must be allowed; but it is a satire of a singular quality, which tells you nothing of that obvious mote, which is engaged from first to last with that invisible beam. It is yourself that is hunted down; these are your own faults that are dragged into the day and numbered, with lingering relish, with cruel cunning and precision. A young friend of Mr. Meredith's (as I have the story) came to him in an agony. "That is too bad of you," he cried. "Willoughby is me!" "No, my dear fellow," said the author; "he is all of us." I have read *The Egoist* five or six

times myself, and I mean to read it again; for I am like the young friend of the anecdote — I think Willoughby an unmanly but a very serviceable exposure of myself.

I suppose, when I am done, I shall find that I have forgotten much that was most influential, as I see already I have forgotten Thoreau, and Hazlitt, whose paper "On the Spirit of Obligations" was a turning-point in my life, and Penn, whose little book of aphorisms had a brief but strong effect on me, and Mitford's *Tales of Old Japan,* wherein I learned for the first time the proper attitude of any rational man to his country's laws — a secret found, and kept, in the Asiatic islands. That I should commemorate all is more than I can hope or the Editor could ask. It will be more to the point, after having said so much upon improving books, to say a word or two about the improvable reader. The gift of reading, as I have called it, is not very common, nor very generally understood. It consists, first of all, in a vast intellectual endowment — a free grace, I find I must call it — by which a man rises to understand that he is not punctually right, nor those from whom he differs absolutely wrong. He may hold dogmas; he may hold them passionately; and he may know that others hold them but coldly, or hold them differently, or hold them not at all. Well, if he has the gift of reading, these others will be full of meat for him. They will see the other side of propositions and the other side of virtues. He need not change his dogma for that, but he may change his reading of that dogma, and he must supplement and correct his deductions from it. A human truth, which is always very much a lie, hides as much of life as it displays. It is men

who hold another truth, or, as it seems to us, perhaps, a dangerous lie, who can extend our restricted field of knowledge, and rouse our drowsy consciences. Something that seems quite new, or that seems insolently false or very dangerous, is the test of a reader. If he tries to see what it means, what truth excuses it, he has the gift, and let him read. If he is merely hurt, or offended, or exclaims upon his author's folly, he had better take to the daily papers; he will never be a reader.

And here, with the aptest illustrative force, after I have laid down my part-truth, I must step in with its opposite. For, after all, we are vessels of a very limited content. Not all men can read all books; it is only in a chosen few that any man will find his appointed food; and the fittest lessons are the most palatable, and make themselves welcome to the mind. A writer learns this early, and it is his chief support; he goes on unafraid, laying down the law; and he is sure at heart that most of what he says is demonstrably false, and much of a mingled strain, and some hurtful, and very little good for service; but he is sure besides that when his words fall into the hands of any genuine reader, they will be weighed and winnowed, and only that which suits will be assimilated; and when they fall into the hands of one who cannot intelligently read, they come there quite silent and inarticulate, falling upon deaf ears, and his secret is kept as if he had not written.

XXI

Pulvis et Umbra

By Robert Louis Stevenson [1]

We look for some reward of our endeavors and are disappointed; not success, not happiness, not even peace of conscience, crowns our ineffectual efforts to do well. Our frailties are invincible, our virtues barren; the battle goes sore against us to the going down of the sun. The canting moralist tells us of right and wrong; and we look abroad, even on the face of our small earth, and find them change with every climate, and no country where some action is not honored for a virtue and none where it is not branded for a vice; and we look in our experience, and find no vital congruity in the wisest rules, but at the best a municipal fitness. It is not strange if we are tempted to despair of good. We ask too much. Our religions and moralities have been trimmed to flatter us, till they are all emasculate and sentimentalized, and only please and weaken. Truth is of a rougher strain. In the harsh face of life, faith can read a bracing gospel. The human race is a thing more ancient than the ten com-

1 "Pulvis et Umbra," Stevenson's "Darwinian Sermon," was first printed in *Scribner's Magazine*, April, 1888. It is here reprinted from his volume, *Across the Plains*, by kind permission of Charles Scribner's Sons. For a brief account of Stevenson see Note at the beginning of the preceding essay.—Editor.

mandments; and the bones and revolutions of the Kosmos, in whose joints we are but moss and fungus, more ancient still.

Of the Kosmos in the last resort, science reports many doubtful things and all of them appalling. There seems no substance to this solid globe on which we stamp: nothing but symbols and ratios. Symbols and ratios carry us and bring us forth and beat us down; gravity that swings the incommensurable suns and worlds through space, is but a figment varying inversely as the squares of distances; and the suns and worlds themselves, imponderable figures of abstraction, NH_3 and H_2O. Consideration dares not dwell upon this view; that way madness lies; science carries us into zones of speculation, where there is no habitable city for the mind of man.

But take the Kosmos with a grosser faith, as our senses give it us. We behold space sown with rotatory islands, suns and worlds and the shards and wrecks of systems: some, like the sun, still blazing; some rotting, like the earth; others, like the moon, stable in desolation. All of these we take to be made of something we call matter: a thing which no analysis can help us to conceive; to whose incredible properties no familiarity can reconcile our minds. This stuff, when not purified by the lustration of fire, rots uncleanly into something we call life; seized through all its atoms with a pediculous malady; swelling in tumors that become independent, sometimes even (by an abhorrent prodigy) locomotory; one splitting into millions, millions cohering into one, as the malady proceeds through varying stages. This vital putrescence

of the dust, used as we are to it, yet strikes us with occasional disgust, and the profusion of worms in a piece of ancient turf, or the air of a marsh darkened with insects, will sometimes check our breathing so that we aspire for cleaner places. But none is clean: the moving sand is infected with lice; the pure spring, where it bursts out of the mountain, is a mere issue of worms; even in the hard rock the crystal is forming.

In two main shapes this eruption covers the countenance of the earth: the animal and the vegetable: one in some degree the inversion of the other: the second rooted to the spot; the first coming detached out of its natal mud, and scurrying abroad with the myriad feet of insects or towering into the heavens on the wings of birds: a thing so inconceivable that, if it be well considered, the heart stops. To what passes with the anchored vermin, we have little clue: doubtless they have their joys and sorrows, their delights and killing agonies: it appears not how. But of the locomotory, to which we ourselves belong, we can tell more. These share with us a thousand miracles: the miracles of sight, of hearing, of the projection of sound, things that bridge space; the miracles of memory and reason, by which the present is conceived, and when it is gone, its image kept living in the brains of man and brute; the miracle of reproduction, with its imperious desires and staggering consequences. And to put the last touch upon this mountain mass of the revolting and the inconceivable, all these prey upon each other, lives tearing other lives in pieces, cramming them inside themselves, and by that summary process, growing fat: the vege-

tarian, the whale, perhaps the tree, not less than the lion of the desert; for the vegetarian is only the eater of the dumb.

Meanwhile our rotatory island loaded with predatory life, and more drenched with blood, both animal and vegetable, than ever mutinied ship, scuds through space with unimaginable speed, and turns alternate cheeks to the reverberation of a blazing world, ninety million miles away.

What a monstrous spectre is this man, the disease of the agglutinated dust, lifting alternate feet or lying drugged with slumber; killing, feeding, growing, bringing forth small copies of himself; grown upon with hair like grass, fitted with eyes that move and glitter in his face; a thing to set children screaming; — and yet looked at nearlier, known as his fellows know him, how surprising are his attributes! Poor soul, here for so little, cast among so many hardships, filled with desires so incommensurate and so inconsistent, savagely surrounded, savagely descended, irremediably condemned to prey upon his fellow lives: who should have blamed him had he been of a piece with his destiny and a being merely barbarous? And we look and behold him instead filled with imperfect virtues: infinitely childish, often admirably valiant, often touchingly kind; sitting down, amidst his momentary life, to debate of right and wrong and the attributes of the deity; rising up to do battle for an egg or die for an idea; singling out his friends and his mate with cordial affection; bringing forth in pain, rearing with long-suffering solicitude, his young. To touch the heart of his mystery, we find in him one thought, strange to the point of

lunacy: the thought of duty; the thought of something owing to himself, to his neighbor, to his God: an ideal of decency, to which he would rise if it were possible; a limit of shame, below which, if it be possible, he will not stoop. The design in most men is one of conformity; here and there, in picked natures, it transcends itself and soars on the other side, arming martyrs with independence; but in all, in their degrees, it is a bosom thought: — Not in man alone, for we trace it in dogs and cats whom we know fairly well, and doubtless some similar point of honor sways the elephant, the oyster, and the louse, of whom we know so little: — But in man, at least, it sways with so complete an empire that merely selfish things come second, even with the selfish: that appetites are starved, fears are conquered, pains supported; that almost the dullest shrinks from the reproof of a glance, although it were a child's; and all but the most cowardly stand amid the risks of war; and the more noble, having strongly conceived an act as due to their ideal, affront and embrace death. Strange enough if, with their singular origin and perverted practice, they think they are to be rewarded in some future life: stranger still, if they are persuaded of the contrary, and think this blow, which they solicit, will strike them senseless for eternity. I shall be reminded what a tragedy of misconception and misconduct man at large presents: of organized injustice, cowardly violence and treacherous crime; and of the damning imperfections of the best. They cannot be too darkly drawn. Man is indeed marked for failure in his efforts to do right. But where the best consistently miscarry, how tenfold more remarkable that all should continue to strive; and surely

we should find it both touching and inspiriting, that in a field from which success is banished, our race should not cease to labor.

If the first view of this creature, stalking in his rotatory isle, be a thing to shake the courage of the stoutest, on this nearer sight, he startles us with an admiring wonder. It matters not where we look, under what climate we observe him, in what stage of society, in what depth of ignorance, burthened with what erroneous morality; by camp-fires in Assiniboia, the snow powdering his shoulders, the wind plucking his blanket, as he sits, passing the ceremonial calumet and uttering his grave opinions like a Roman senator; in ships at sea, a man inured to hardship and vile pleasures, his brightest hope a fiddle in a tavern and a bedizened trull who sells herself to rob him, and he for all that simple, innocent, cheerful, kindly like a child, constant to toil, brave to drown, for others; in the slums of cities, moving among indifferent millions to mechanical employments, without hope of change in the future, with scarce a pleasure in the present, and yet true to his virtues, honest up to his lights, kind to his neighbors, tempted perhaps in vain by the bright gin-palace, perhaps long-suffering with the drunken wife that ruins him; in India (a woman this time) kneeling with broken cries and streaming tears, as she drowns her child in the sacred river; in the brothel, the discard of society, living mainly on strong drink, fed with affronts, a fool, a thief, the comrade of thieves, and even here keeping the point of honor and the touch of pity, often repaying the world's scorn with service, often standing firm upon a scruple, and at a certain cost, rejecting riches: — everywhere some

virtue cherished or affected, everywhere some decency of thought and carriage, everywhere the ensign of man's ineffectual goodness: — ah! if I could show you this! if I could show you these men and women, all the world over, in every stage of history, under every abuse of error, under every circumstance of failure, without hope, without help, without thanks, still obscurely fighting the lost fight of virtue, still clinging, in the brothel or on the scaffold, to some rag of honor, the poor jewel of their souls! They may seek to escape, and yet they cannot; it is not alone their privilege and glory, but their doom; they are condemned to some nobility; all their lives long, the desire of good is at their heels, the implacable hunter.

Of all earth's meteors, here at least is the most strange and consoling: that this ennobled lemur, this hair-crowned bubble of the dust, this inheritor of a few years and sorrows, should yet deny himself his rare delights, and add to his frequent pains, and live for an ideal, however misconceived. Nor can we stop with man. A new doctrine, received with screams a little while ago by canting moralists, and still not properly worked into the body of our thoughts, lights us a step farther into the heart of this rough but noble universe. For nowadays the pride of man denies in vain his kinship with the original dust. He stands no longer like a thing apart. Close at his heels we see the dog, prince of another genus: and in him too, we see dumbly testified the same cultus of an unattainable ideal, the same constancy in failure. Does it stop with the dog? We look at our feet where the ground is blackened with the swarming ant: a creature so small,

so far from us in the hierarchy of brutes, that we can scarce trace and scarce comprehend his doings; and here also, in his ordered polities and rigorous justice, we see confessed the law of duty and the fact of individual sin. Does it stop, then, with the ant? Rather this desire of well-doing and this doom of frailty run through all the grades of life: rather is this earth, from the frosty top of Everest to the next margin of the internal fire, one stage of ineffectual virtues and one temple of pious tears and perseverance. The whole creation groaneth and travaileth together. It is the common and the god-like law of life. The browsers, the biters, the barkers, the hairy coats of field and forest, the squirrel in the oak, the thousand-footed creeper in the dust, as they share with us the gift of life, share with us the love of an ideal: strive like us — like us are tempted to grow weary of the struggle — to do well; like us receive at times unmerited refreshment, visitings of support, returns of courage; and are condemned like us to be crucified between that double law of the members and the will. Are they like us, I wonder, in the timid hope of some reward, some sugar with the drug? do they, too, stand aghast at unrewarded virtues, at the sufferings of those whom, in our partiality, we take to be just, and the prosperity of such as, in our blindness, we call wicked? It may be, and yet God knows what they should look for. Even while they look, even while they repent, the foot of man treads them by thousands in the dust, the yelping hounds burst upon their trail, the bullet speeds, the knives are heating in the den of the vivisectionist; or the dew falls, and the generation of a day is blotted out. For these are creatures, compared with whom

our weakness is strength, our ignorance wisdom, our brief span eternity.

And as we dwell, we living things, in our isle of terror and under the imminent hand of death, God forbid it should be man the erected, the reasoner, the wise in his own eyes — God forbid it should be man that wearies in well-doing, that despairs of unrewarded effort, or utters the language of complaint. Let it be enough for faith, that the whole creation groans in mortal frailty, strives with unconquerable constancy: Surely not all in vain.

XXII

Self-Reliance

By Ralph Waldo Emerson [1]

"Ne te quæsiveris extra."

Cast the bantling on the rocks,
Suckle him with the she-wolf's teat,
Wintered with the hawk and fox,
Power and speed be hands and feet.

THERE is a time in every man's education when he arrives at the conviction that envy is ignorance; that imitation is suicide; that he must take himself for better for worse as his portion; that though the wide universe is full of good, no kernel of nourishing corn can come to him but through his toil bestowed on that

1 This essay was one of the First Series of Emerson's *Essays*, published in 1841: the text as here given includes Emerson's revisions of 1848 and 1876; it is used with the kind permission of the Houghton Mifflin Company, owners of the copyright. About half the essay has been omitted, but the parts which are given preserve the essential points.

Ralph Waldo Emerson, 1803–1882, the American essayist and lecturer, was one of the famous group of Concord philosophers and an eloquent exponent of the uncompromising idealism of the transcendental school. Emerson's work is a glorification of intuition and of individualism. He distrusted reasoning and argument and would have a man live, in all the deeper relations of life, by his own feelings and his own "inner light." He was a poet even when he wrote in prose, and the interest of this essay in connection with the other points of view represented in this collection lies precisely in the fact that it is a plea for the poetic and intuitional sides of man's mind which have their authority no less than reason. It is included here in the belief that in learning to adjust the claims of these two avenues to knowledge lies the beginning of wisdom.—EDITOR.

plot of ground which is given to him to till. The power which resides in him is new in nature, and none but he knows what that is which he can do, nor does he know until he has tried. Not for nothing one face, one character, one fact, makes much impression on him, and another none. This sculpture in the memory is not without preëstablished harmony. The eye was placed where one ray should fall, that it might testify of that particular ray. We but half express ourselves, and are ashamed of that divine idea which each of us represents. It may be safely trusted as proportionate and of good issues, so it be faithfully imparted, but God will not have his work made manifest by cowards. A man is relieved and gay when he has put his heart into his work and done his best; but what he has said or done otherwise shall give him no peace. It is a deliverance which does not deliver. In the attempt his genius deserts him; no muse befriends; no invention, no hope.

Trust thyself: every heart vibrates to that iron string. Accept the place the divine providence has found for you, the society of your contemporaries, the connection of events. Great men have always done so, and confided themselves childlike to the genius of their age, betraying their perception that the absolutely trustworthy was seated at their heart, working through their hands, predominating in all their being. And we are now men, and must accept in the highest mind the same transcendent destiny; and not minors and invalids in a protected corner, not cowards fleeing before a revolution, but guides, redeemers and benefactors, obeying the Almighty effort and advancing on Chaos and the Dark.

What pretty oracles nature yields us on this text in the face and behavior of children, babes, and even brutes! That divided and rebel mind, that distrust of a sentiment because our arithmetic has computed the strength and means opposed to our purpose, these have not. Their mind being whole, their eye is as yet unconquered, and when we look in their faces we are disconcerted. Infancy conforms to nobody; all conform to it; so that one babe commonly makes four or five out of the adults who prattle and play to it. So God has armed youth and puberty and manhood no less with its own piquancy and charm, and made it enviable and gracious and its claims not to be put by, if it will stand by itself. Do not think the youth has no force, because he cannot speak to you and me. Hark! in the next room his voice is sufficiently clear and emphatic. It seems he knows how to speak to his contemporaries. Bashful or bold then, he will know how to make us seniors very unnecessary.

The nonchalance of boys who are sure of a dinner, and would disdain as much as a lord to do or say aught to conciliate one, is the healthy attitude of human nature. A boy is in the parlor what the pit is in the playhouse; independent, irresponsible, looking out from his corner on such people and facts as pass by, he tries and sentences them on their merits, in the swift, summary way of boys, as good, bad, interesting, silly, eloquent, troublesome. He cumbers himself never about consequences, about interests; he gives an independent, genuine verdict. You must court him; he does not court you. But the man is as it were clapped into jail by his consciousness. As soon as he has once acted or spoken with *éclat* he is a committed person, watched

by the sympathy or the hatred of hundreds, whose affections must now enter into his account. There is no Lethe for this. Ah, that he could pass again into his neutrality! Who can thus avoid all pledges and, having observed, observe again from the same unaffected, unbiased, unbribable, unaffrighted innocence,— must always be formidable. He would utter opinions on all passing affairs, which being seen to be not private but necessary, would sink like darts into the ear of men and put them in fear.

These are the voices which we hear in solitude, but they grow faint and inaudible as we enter into the world. Society everywhere is in conspiracy against the manhood of every one of its members. Society is a joint-stock company, in which the members agree, for the better securing of his bread to each shareholder, to surrender the liberty and culture of the eater. The virtue in most request is conformity. Self-reliance is its aversion. It loves not realities and creators, but names and customs.

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The other terror that scares us from self-trust is our consistency; a reverence for our past act or word because the eyes of others have no other data for computing our orbit than our past acts, and we are loth to disappoint them.

But why should you keep your head over your shoulder? Why drag about this corpse of your memory, lest you contradict somewhat you have stated in this or that public place? Suppose you should contradict yourself; what then? It seems to be a rule of wisdom never to rely on your memory alone, scarcely even in acts of pure memory, but to bring the past for judgment into

the thousand-eyed present, and live ever in a new day. In your metaphysics you have denied personality to the Deity, yet when the devout motions of the soul come, yield to them heart and life, though they should clothe God with shape and color. Leave your theory, as Joseph his coat in the hand of the harlot, and flee.

A foolish consistency is the hobgoblin of little minds, adored by little statesmen and philosophers and divines. With consistency a great soul has simply nothing to do. He may as well concern himself with his shadow on the wall. Speak what you think now in hard words and to-morrow speak what to-morrow thinks in hard words again, though it contradict every thing you said to-day. — 'Ah, so you shall be sure to be misunderstood.' — Is it so bad then to be misunderstood? Pythagoras was misunderstood, and Socrates, and Jesus, and Luther, and Copernicus, and Galileo, and Newton, and every pure and wise spirit that ever took flesh. To be great is to be misunderstood.

I suppose no man can violate his nature. All the sallies of his will are rounded in by the law of his being, as the inequalities of Andes and Himmaleh are insignificant in the curve of the sphere. Nor does it matter how you gauge and try him. A character is like an acrostic or Alexandrian stanza; — read it forward, backward, or across, it still spells the same thing. In this pleasing contrite wood-life which God allows me, let me record day by day my honest thought without prospect or retrospect, and, I cannot doubt, it will be found symmetrical, though I mean it not and see it not. My book should smell of pines and resound with the hum of insects. The swallow over my window should interweave that thread or straw he carries in

his bill into my web also. We pass for what we are. Character teaches above our wills. Men imagine that they communicate their virtue or vice only by overt actions, and do not see that virtue or vice emit a breath every moment.

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Let a man then know his worth, and keep things under his feet. Let him not peep or steal, or skulk up and down with the air of a charity-boy, a bastard, or an interloper in the world which exists for him. But the man in the street, finding no worth in himself which corresponds to the force which built a tower or sculptured a marble god, feels poor when he looks on these. To him a palace, a statue, or a costly book have an alien and forbidding air, much like a gay equipage, and seem to say like that, 'Who are you, Sir?' Yet they all are his, suitors for his notice, petitioners to his faculties that they will come out and take possession. The picture waits for my verdict; it is not to command me, but I am to settle its claims to praise. That popular fable of the sot who was picked up dead-drunk in the street, carried to the duke's house, washed and dressed and laid in the duke's bed, and, on his waking, treated with all obsequious ceremony like the duke, and assured that he had been insane, owes its popularity to the fact that it symbolizes so well the state of man, who is in the world a sort of sot, but now and then wakes up, exercises his reason and finds himself a true prince.

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The magnetism which all original action exerts is explained when we inquire the reason of self-trust. Who is the Trustee? What is the aboriginal Self, on

which a universal reliance may be grounded? What is the nature and power of that science-baffling star, without parallax, without calculable elements, which shoots a ray of beauty even into trivial and impure actions, if the least mark of independence appear? The inquiry leads us to that source, at once the essence of genius, of virtue, and of life, which we call Spontaneity or Instinct. We denote this primary wisdom as Intuition, whilst all later teachings are tuitions. In that deep force, the last fact behind which analysis cannot go, all things find their common origin. For the sense of being which in calm hours rises, we know not how, in the soul, is not diverse from things, from space, from light, from time, from man, but one with them and proceeds obviously from the same source whence their life and being also proceed. We first share the life by which things exist and afterwards see them as appearances in nature and forget that we have shared their cause. Here is the fountain of action and of thought. Here are the lungs of that inspiration which giveth man wisdom and which cannot be denied without impiety and atheism. We lie in the lap of immense intelligence, which makes us receivers of its truth and organs of its activity. When we discern justice, when we discern truth, we do nothing of ourselves, but allow a passage to its beams. If we ask whence this comes, if we seek to pry into the soul that causes, all philosophy is at fault. Its presence or its absence is all we can affirm. Every man discriminates between the voluntary acts of his mind and his involuntary perceptions, and knows that to his involuntary perceptions a perfect faith is due. He may err in the expression of them, but he knows that these things are so, like day

and night, not to be disputed. My wilful actions and acquisitions are but roving; — the idlest reverie, the faintest native emotion, command my curiosity and respect. Thoughtless people contradict as readily the statement of perceptions as of opinions, or rather much more readily; for they do not distinguish between perception and notion. They fancy that I choose to see this or that thing. But perception is not whimsical, but fatal. If I see a trait, my children will see it after me, and in course of time all mankind,— although it may chance that no one has seen it before me. For my perception of it is as much a fact as the sun.

The relations of the soul to the divine spirit are so pure that it is profane to seek to interpose helps. It must be that when God speaketh he should communicate, not one thing, but all things; should fill the world with his voice; should scatter forth light, nature, time, souls, from the centre of the present thought; and new date and new create the whole. Whenever a mind is simple and receives a divine wisdom, old things pass away,— means, teachers, texts, temples fall; it lives now, and absorbs past and future into the present hour. All things are made sacred by relation to it,— one as much as another. All things are dissolved to their centre by their cause, and in the universal miracle petty and particular miracles disappear. If therefore a man claims to know and speak of God and carries you backward to the phraseology of some old mouldered nation in another country, in another world, believe him not. Is the acorn better than the oak which is its fulness and completion? Is the parent better than the child into whom he has cast his ripened being? Whence then this worship of the past? The centuries

are conspirators against the sanity and authority of the soul. Time and space are but physiological colors which the eye makes, but the soul is light: where it is, is day; where it was, is night; and history is an impertinence and an injury if it be any thing more than a cheerful apologue or parable of my being and becoming.

Man is timid and apologetic; he is no longer upright; he dares not say 'I think,' 'I am,' but quotes some saint or sage. He is ashamed before the blade of grass or the blowing rose. These roses under my window make no reference to former roses or to better ones; they are for what they are; they exist with God today. There is no time to them. There is simply the rose; it is perfect in every moment of its existence. Before a leaf-bud has burst, its whole life acts; in the full-blown flower there is no more; in the leafless root there is no less. Its nature is satisfied and it satisfies nature in all moments alike. But man postpones or remembers; he does not live in the present, but with reverted eye laments the past, or, heedless of the riches that surround him, stands on tiptoe to foresee the future. He cannot be happy and strong until he too lives with nature in the present, above time.

This should be plain enough. Yet see what strong intellects dare not yet hear God himself unless he speak the phraseology of I know not what David, or Jeremiah, or Paul. We shall not always set so great a price on a few texts, on a few lives. We are like children who repeat by rote the sentences of grandames and tutors, and, as they grow older, of the men of talents and character they chance to see,— painfully recollecting the exact words they spoke; afterwards, when

they come into the point of view which those had who uttered these sayings, they understand them and are willing to let the words go; for at any time they can use words as good when occasion comes. If we live truly, we shall see truly. It is as easy for the strong man to be strong, as it is for the weak to be weak. When we have new perception, we shall gladly disburden the memory of its hoarded treasures as old rubbish. When a man lives with God, his voice shall be as sweet as the murmur of the brook and the rustle of the corn.

And now at last the highest truth on this subject remains unsaid; probably cannot be said; for all that we say is the far-off remembering of the intuition. That thought by what I can now nearest approach to say it, is this. When good is near you, when you have life in yourself, it is not by any known or accustomed way; you shall not discern the footprints of any other; you shall not see the face of man; you shall not hear any name; — the way, the thought, the good, shall be wholly strange and new. It shall exclude example and experience. You take the way from man, not to man. All persons that ever existed are its forgotten ministers. Fear and hope are alike beneath it. There is somewhat low even in hope. In the hour of vision there is nothing that can be called gratitude, nor properly joy. The soul raised over passion beholds identity and eternal causation, perceives the self-existence of Truth and Right, and calms itself with knowing that all things go well. Vast spaces of nature, the Atlantic Ocean, the South Sea; long intervals of time, years, centuries, are of no account. This which I think and feel underlay every former state of life and circumstances, as it

does underlie my present, and what is called life and what is called death.

Life only avails, not the having lived. Power ceases in the instant of repose; it resides in the moment of transition from a past to a new state, in the shooting of the gulf, in the darting to an aim. This one fact the world hates; that the soul *becomes;* for that forever degrades the past, turns all riches to poverty, all reputation to a shame, confounds the saint with the rogue, shoves Jesus and Judas equally aside. Why then do we prate of self-reliance? Inasmuch as the soul is present there will be power not confident but agent. To talk of reliance is a poor external way of speaking. Speak rather of that which relies because it works and is. Who has more obedience than I masters me, though he should not raise his finger. Round him I must revolve by the gravitation of spirits. We fancy it rhetoric when we speak of eminent virtue. We do not yet see that virtue is Height, and that a man or a company of men, plastic and permeable to principles, by the law of nature must overpower and ride all cities, nations, kings, rich men, poets, who are not.

This is the ultimate fact which we so quickly reach on this, as on every topic, the resolution of all into the ever-blessed ONE. Self-existence is the attribute of the Supreme Cause, and it constitutes the measure of good by the degree in which it enters into all lower forms. All things real are so by so much virtue as they contain. Commerce, husbandry, hunting, whaling, war, eloquence, personal weight, are somewhat, and engage my respect as examples of its presence and impure action. I see the same law working in nature for conservation and growth. Power is, in nature, the

essential measure of right. Nature suffers nothing to remain in her kingdoms which cannot help itself. The genesis and maturation of a planet, its poise and orbit, the bended tree recovering itself from the strong wind, the vital resources of every animal and vegetable, are demonstrations of the self-sufficing and therefore self-relying soul.

Thus all concentrates: let us not rove; let us sit at home with the cause. Let us stun and astonish the intruding rabble of men and books and institutions by a simple declaration of the divine fact. Bid the invaders take the shoes from off their feet, for God is here within. Let our simplicity judge them, and our docility to our own law demonstrate the poverty of nature and fortune beside our native riches.

But now we are a mob. Man does not stand in awe of man, nor is his genius admonished to stay at home to put itself in communication with the internal ocean, but it goes abroad to beg a cup of water of the urns of other men. We must go alone. I like the silent church before the service begins, better than any preaching. How far off, how cool, how chaste the persons look, begirt each one with a precinct or sanctuary! So let us always sit. Why should we assume the faults of our friend, or wife, or father, or child, because they sit around our hearth, or are said to have the same blood? All men have my blood and I have all men's. Not for that will I adopt their petulance or folly, even to the extent of being ashamed of it. But your isolation must not be mechanical, but spiritual, that is, must be elevation. At times the whole world seems to be in conspiracy to importune you with emphatic trifles. Friend, client, child, sickness, fear, want, charity, all

knock at once at thy closet door and say,— 'Come out unto us.' But keep thy state; come not into their confusion. The power men possess to annoy me I give them by a weak curiosity. No man can come near me but through my act. "What we love that we have, but by desire we bereave ourselves of the love."

If we cannot at once rise to the sanctities of obedience and faith, let us at least resist our temptations; let us enter into the state of war and wake Thor and Woden, courage and constancy, in our Saxon breasts. This is to be done in our smooth times by speaking the truth. Check this lying hospitality and lying affection. Live no longer to the expectation of these deceived and deceiving people with whom we converse. Say to them, 'O father, O mother, O wife, O brother, O friend, I have lived with you after appearances hitherto. Henceforward I am the truth's. Be it known unto you that henceforward I obey no law less than the eternal law. I will have no covenants but proximities. I shall endeavor to nourish my parents, to support my family, to be the chaste husband of one wife,— but these relations I must fill after a new and unprecedented way. I appeal from your customs. I must be myself. I cannot break myself any longer for you, or you. If you can love me for what I am, we shall be the happier. If you cannot, I will still seek to deserve that you should. I will not hide my tastes or aversions. I will so trust that what is deep is holy, that I will do strongly before the sun and moon whatever inly rejoices me and the heart appoints. If you are noble, I will love you; if you are not, I will not hurt you and myself by hypocritical attentions. If you are true, but not in the same truth with me, cleave to your com-

panions; I will seek my own. I do this not selfishly but humbly and truly. It is alike your interest, and mine, and all men's, however long we have dwelt in lies, to live in truth. Does this sound harsh to-day? You will soon love what is dictated by your nature as well as mine, and if we follow the truth it will bring us out safe at last.' — But so may you give these friends pain. Yes, but I cannot sell my liberty and my power, to save their sensibility. Besides, all persons have their moments of reason, when they look out into the region of absolute truth; then will they justify me and do the same thing.

The populace think that your rejection of popular standards is a rejection of all standard, and mere antinomianism; and the bold sensualist will use the name of philosophy to gild his crimes. But the law of consciousness abides. There are two confessionals, in one or the other of which we must be shriven. You may fulfil your round of duties by clearing yourself in the *direct* or in the *reflex* way. Consider whether you have satisfied your relations to father, mother, cousin, neighbor, town, cat and dog — whether any of these can upbraid you. But I may also neglect this reflex standard and absolve me to myself. I have my own stern claims and perfect circle. It denies the name of duty to many offices that are called duties. But if I can discharge its debts it enables me to dispense with the popular code. If any one imagines that this law is lax, let him keep its commandment one day.

And truly it demands something godlike in him who has cast off the common motives of humanity and has ventured to trust himself for a taskmaster. High be his heart, faithful his will, clear his sight, that he may

in good earnest be doctrine, society, law, to himself, that a simple purpose may be to him as strong as iron necessity is to others!

If any man consider the present aspects of what is called by distinction *society,* he will see the need of these ethics. The sinew and heart of man seem to be drawn out, and we are become timorous, desponding whimperers. We are afraid of truth, afraid of fortune, afraid of death, and afraid of each other. Our age yields no great and perfect persons. We want men and women who shall renovate life and our social state, but we see that most natures are insolvent, cannot satisfy their own wants, have an ambition out of all proportion to their practical force and do lean and beg day and night continually. Our housekeeping is mendicant, our arts, our occupations, our marriages, our religion we have not chosen, but society has chosen for us. We are parlor soldiers. We shun the rugged battle of fate, where strength is born.

If our young men miscarry in their first enterprises they lose all heart. If the young merchant fails, men say he is *ruined.* If the finest genius studies at one of our colleges and is not installed in an office within one year afterwards in the cities or suburbs of Boston or New York, it seems to his friends and to himself that he is right in being disheartened and in complaining the rest of his life. A sturdy lad from New Hampshire or Vermont, who in turn tries all the professions, who *teams it, farms it, peddles,* keeps a school, preaches, edits a newspaper, goes to Congress, buys a township, and so forth, in successive years, and always like a cat falls on his feet, is worth a hundred of these city dolls. He walks abreast with his days and feels no shame in

not 'studying a profession,' for he does not postpone his life, but lives already. He has not one chance, but a hundred chances. Let a Stoic open the resources of man and tell men they are not leaning willows, but can and must detach themselves; that with the exercise of self-trust, new powers shall appear; that a man is the word made flesh, born to shed healing to the nations; that he should be ashamed of our compassion, and that the moment he acts from himself, tossing the laws, the books, idolatries and customs out of the window, we pity him no more but thank and revere him; — and that teacher shall restore the life of man to splendor and make his name dear to all history.

XXIII

Plugson of Undershot

By Thomas Carlyle [1]

One thing I do know: Never, on this Earth, was the relation of man to man long carried on by Cash-payment alone. If, at any time, a philosophy of Laissez-faire, Competition and Supply-and-demand, start up as the exponent of human relations, expect that it will soon end.

Such philosophies will arise: for man's philosophies are usually the 'supplement of his practice;' some ornamental Logic-varnish, some outer skin of Articulate Intelligence, with which he strives to render his dumb Instinctive Doings presentable when they are done. Such philosophies will arise; be preached as Mammon-Gospels, the ultimate Evangel of the World;

1 This essay and the two following are taken from Carlyle's *Past and Present*, 1843, a discussion of the social and industrial troubles of Carlyle's day. The difficulties Carlyle is wrestling with have not yet been solved: they constitute, in all main essentials, the problem of industry at present, and are matters of immediate practical importance to the engineer.

Thomas Carlyle, 1795–1881, was one of the greatest of the English men of letters of the nineteenth century. He was so little of a time-server and he set himself so resolutely against the materialism and utilitarianism of his day, that he had a hard fight to win recognition as a writer. His character, at once irritable, pugnacious, and idealistic, is well reflected in his style. The student who wishes to make further study of his work should begin with *Heroes and Hero-Worship* or *Sartor Resartus* and then *Past and Present* and the *French Revolution*.— Editor.

be believed, with what is called belief, with much superficial bluster, and a kind of shallow satisfaction real in its way: — but they are ominous gospels! They are the sure, and even swift, forerunner of great changes. Expect that the old System of Society is done, is dying and fallen into dotage, when it begins to rave in that fashion. Most Systems that I have watched the death of, for the last three thousand years, have gone just so. The Ideal, the True and Noble that was in them having faded out, and nothing now remaining but naked Egoism, vulturous Greediness, they cannot live; they are bound and inexorably ordained by the oldest Destinies, Mothers of the Universe, to die. Curious enough: they thereupon, as I have pretty generally noticed, devise some light comfortable kind of 'wine-and-walnuts philosophy' for themselves, this of Supply-and-demand or another; and keep saying, during hours of mastication and rumination, which they call hours of meditation: "Soul, take thy ease; it is all *well* that thou art a vulture-soul;" — and pangs of dissolution come upon them, oftenest before they are aware!

Cash-payment never was, or could except for a few years be, the union-bond of man to man. Cash never yet paid one man fully his deserts to another; nor could it, nor can it, now or henceforth to the end of the world. I invite his Grace of Castle-Rackrent to reflect on this; — does he think that a Land Aristocracy when it becomes a Land Auctioneership can have long to live? Or that Sliding-scales will increase the vital stamina of it? The indomitable Plugson too, of the respected Firm of Plugson, Hunks and Company, in St. Dolly Undershot, is invited to reflect on this; for to him also it will be new, perhaps even newer. Book-keeping by

double entry is admirable, and records several things in an exact manner. But the Mother-Destinies also keep their Tablets; in Heaven's Chancery also there goes on a recording; and things, as my Moslem friends say, are 'written on the iron leaf.'

Your Grace and Plugson, it is like, go to Church occasionally: did you never in vacant moments, with perhaps a dull parson droning to you, glance into your New Testament, and the cash-account stated four times over, by a kind of quadruple entry,— in the Four Gospels there? I consider that a cash-account, and balance-statement of work done and wages paid, worth attending to. Precisely *such,* though on a smaller scale, go on at all moments under this Sun; and the statement and balance of them in the Plugson Ledgers and on the Tablets of Heaven's Chancery are discrepant exceedingly; — which ought really to teach, and to have long since taught, an indomitable common-sense Plugson of Undershot, much more an unattackable *un*-common-sense Grace of Rackrent, a thing or two! — In brief, we shall have to dismiss the Cash-Gospel rigorously into its own place: we shall have to know, on the threshold, that either there is some infinitely deeper Gospel, subsidiary, explanatory and daily and hourly corrective, to the Cash one; or else that the Cash one itself and all others are fast travelling!

For all human things do require to have an Ideal in them; to have some Soul in them, as we said, were it only to keep the Body unputrified. And wonderful it is to see how the Ideal or Soul, place it in what ugliest Body you may, will irradiate said Body with its own nobleness; will gradually, incessantly, mould, modify,

new-form or reform said ugliest Body, and make it at last beautiful, and to a certain degree divine! — Oh, if you could dethrone that Brute-god Mammon, and put a Spirit-god in his place! One way or other, he must and will have to be dethroned.

Fighting, for example, as I often say to myself, Fighting with steel murder-tools is surely a much uglier operation than Working, take it how you will. Yet even of Fighting, in religious Abbot Samson's days, see what a Feudalism there had grown,— a 'glorious Chivalry,' much besung down to the present day. Was not that one of the 'impossiblest' things? Under the sky is no uglier spectacle than two men with clenched teeth, and hell-fire eyes, hacking one another's flesh, converting precious living bodies, and priceless living souls, into nameless masses of putrescence, useful only for turnip-manure. How did a Chivalry ever come out of that; how anything that was not hideous, scandalous, infernal? It will be a question worth considering by and by.

I remark, for the present, only two things: first, that the Fighting itself was not, as we rashly suppose it, a Fighting without cause, but more or less with cause. Man is created to fight; he is perhaps best of all definable as a born soldier; his life 'a battle and a march,' under the right General. It is forever indispensable for a man to fight: now with Necessity, with Barrenness, Scarcity, with Puddles, Bogs, tangled Forests, unkempt Cotton; — now also with the hallucinations of his poor fellow Men. Hallucinatory visions rise in the head of my poor fellow man; make him claim over me rights which are not his. All fighting, as we noticed long ago, is the dusty conflict of strengths, each think-

ing itself the strongest, or, in other words, the justest; — of Mights which do in the long-run, and forever will in this just Universe in the long-run, mean Rights. In conflict the perishable part of them, beaten sufficiently, flies off into dust: this process ended, appears the imperishable, the true and exact.

And now let us remark a second thing: how, in these baleful operations, a noble devout-hearted Chevalier will comport himself, and an ignoble godless Bucanier and Chactaw Indian. Victory is the aim of each. But deep in the heart of the noble man it lies forever legible, that as an Invisible Just God made him, so will and must God's Justice and this only, were it never so invisible, ultimately prosper in all controversies and enterprises and battles whatsoever. What an Influence; ever-present,— like a Soul in the rudest Caliban of a body; like a ray of Heaven, and illuminative creative *Fiat-Lux,* in the wastest terrestrial Chaos! Blessed divine Influence, traceable even in the horror of Battlefields and garments rolled in blood: how it ennobles even the Battlefield; and, in place of a Chactaw Massacre, makes it a Field of Honor! A Battlefield too is great. Considered well, it is a kind of Quintessence of Labor; Labor distilled into its utmost concentration; the significance of years of it compressed into an hour. Here too thou shalt be strong, and not in muscle only, if thou wouldst prevail. Here too thou shalt be strong of heart, noble of soul; thou shalt dread no pain or death, thou shalt not love ease or life; in rage, thou shalt remember mercy, justice; — thou shalt be a Knight and not a Chactaw, if thou wouldst prevail! It is the rule of all battles, against hallucinating fellow Men, against unkempt Cotton, or whatsoever battles

they may be, which a man in this world has to fight.

Howel Davies dyes the West-Indian Seas with blood, piles his decks with plunder; approves himself the expertest Seaman, the daringest Seafighter: but he gains no lasting victory, lasting victory is not possible for him. Not, had he fleets larger than the combined British Navy all united with him in bucaniering. He, once for all, cannot prosper in his duel. He strikes down his man: yes; but his man, or his man's representative, has no notion to lie struck down; neither, though slain ten times, will he keep so lying; — nor has the Universe any notion to keep him so lying! On the contrary, the Universe and he have, at all moments, all manner of motives to start up again, and desperately fight again. Your Napoleon is flung out, at last, to St. Helena; the latter end of him sternly compensating the beginning. The Bucanier strikes down a man, a hundred or a million men: but what profits it? He has one enemy never to be struck down; nay two enemies: Mankind and the Maker of Men. On the great scale or on the small, in fighting of men or fighting of difficulties, I will not embark my venture with Howel Davies: it is not the Bucanier, it is the Hero only that can gain victory, that can do more than *seem* to succeed. These things will deserve meditating; for they apply to all battle and soldiership, all struggle and effort whatsoever in this Fight of Life. It is a poor Gospel, Cash-Gospel or whatever name it have, that does not, with clear tone, uncontradictable, carrying conviction to all hearts, forever keep men in mind of these things.

Unhappily, my indomitable friend Plugson of Undershot has, in a great degree, forgotten them;— as,

alas, all the world has; as, alas, our very Dukes and Soul-Overseers have, whose special trade it was to remember them! Hence these tears. — Plugson, who has indomitably spun Cotton merely to gain thousands of pounds, I have to call as yet a Bucanier and Chactaw; till there come something better, still more indomitable from him. His hundred Thousand-pound Notes, if there be nothing other, are to me but as the hundred Scalps in a Chactaw wigwam. The blind Plugson: he was a Captain of Industry, born member of the Ultimate genuine Aristocracy of this Universe, could he have known it! These thousand men that span and toiled round him, they were a regiment whom he had enlisted, man by man; to make war on a very genuine enemy: Bareness of back, and disobedient Cotton-fibre, which will not, unless forced to it, consent to cover bare backs. Here is a most genuine enemy; over whom all creatures will wish him victory. He enlisted his thousand men: said to them, "Come, brothers, let us have a dash at Cotton!" They follow with cheerful shout; they gain such a victory over Cotton as the Earth has to admire and clap hands at: but, alas, it is yet only of the Bucanier or Chactaw sort, — as good as no victory! Foolish Plugson of St. Dolly Undershot: does he hope to become illustrious by hanging up the scalps in his wigwam, the hundred thousands at his banker's, and saying, Behold my scalps? Why, Plugson, even thy own host is all in mutiny: Cotton is conquered; but the 'bare backs' — are worse covered than ever! Indomitable Plugson, thou must cease to be a Chactaw; thou and others; thou thyself, if no other!

Did William the Norman Bastard, or any of his

Taillefers, *Ironcutters,* manage so? Ironcutter, at the end of the campaign, did not turn-off his thousand fighters, but said to them: "Noble fighters, this is the land we have gained; be I Lord in it, — what we will call *Law-ward,* maintainer and *keeper* of Heaven's *Laws:* be I *Law-ward,* or in brief orthoepy *Lord* in it, and be ye Loyal Men around me in it; and we will stand by one another, as soldiers round a captain, for again we shall have need of one another!" Plugson, bucanier-like, says to them: "Noble spinners, this is the Hundred Thousand we have gained, wherein I mean to dwell and plant vineyards; the hundred thousand is mine, the three and sixpence daily was yours: adieu, noble spinners; drink my health with this groat each, which I give you over and above!" The entirely unjust Captain of Industry, say I; not Chevalier, but Bucanier! 'Commercial Law' does indeed acquit him; asks, with wide eyes, What else? So too Howel Davies asks, Was it not according to the strictest Bucanier Custom? Did I depart in any jot or tittle from the Laws of the Bucaniers?

After all, money, as they say, is miraculous. Plugson wanted victory; as Chevaliers and Bucaniers, and all men alike do. He found money recognised, by the whole world with one assent, as the true symbol, exact equivalent and synonym of victory; — and here we have him, a grimbrowed, indomitable Bucanier, coming home to us with a 'victory,' which the whole world is *ceasing* to clap hands at! The whole world, taught somewhat impressively, is beginning to recognise that such victory is but half a victory; and that now, if it please the Powers, we must — have the other half!

Money is miraculous. What miraculous facilities

has it yielded, will it yield us; but also what never-imagined confusions, obscurations has it brought in; down almost to total extinction of the moral-sense in large masses of mankind! 'Protection of property,' of what is '*mine*,' means with most men protection of money, — the thing which, had I a thousand padlocks over it, is least of all *mine;* is, in a manner, scarcely worth calling mine! The symbol shall be held sacred, defended everywhere with tipstaves, ropes and gibbets; the thing signified shall be composedly cast to the dogs. A human being who has worked with human beings clears all scores with them, cuts himself with triumphant completeness forever loose from them, by paying down certain shillings and pounds. Was it not the wages I promised you? There they are, to the last sixpence,— according to the Laws of the Bucaniers! — Yes, indeed; — and, at such times, it becomes imperatively necessary to ask all persons, bucaniers and others, Whether these same respectable Laws of the Bucaniers are written on God's eternal Heavens at all, on the inner Heart of Man at all; or on the respectable Bucanier Logbook merely, for the convenience of bucaniering merely? What a question; — whereat Westminster Hall shudders to its driest parchment; and on the dead wigs each particular horsehair stands on end!

The Laws of Laissez-faire, O Westminster, the laws of industrial Captain and industrial Soldier, how much more of idle Captain and industrial Soldier, will need to be remodelled, and modified, and rectified in a hundred and a hundred ways,— and *not* in the Sliding-scale direction, but in the totally opposite one! With two million industrial Soldiers already sitting in

Bastilles, and five million pining on potatoes, methinks Westminster cannot begin too soon! — A man has other obligations laid on him, in God's Universe, than the payment of cash: these also Westminster, if it will continue to exist and have board-wages, must contrive to take some charge of: — by Westminster or by another, they must and will be taken charge of; be, with whatever difficulty, got articulated, got enforced, and to a certain approximate extent put in practice. And, as I say, it cannot be too soon! For Mammonism, left to itself, has become Midas-eared; and with all its gold mountains, sits starving for want of bread: and Dilettantism with its partridge-nets, in this extremely earnest Universe of ours, is playing somewhat too high a game. 'A man by the very look of him promises so much:' yes; and by the rent-roll of him does he promise nothing? —

Alas, what a business will this be, which our Continental friends, groping this long while somewhat absurdly about it and about it, call 'Organisation of Labor;' — which must be taken out of the hands of absurd windy persons, and put into the hands of wise, laborious, modest and valiant men, to begin with it straightway; to proceed with it, and succeed in it more and more, if Europe, at any rate if England, is to continue habitable much longer. Looking at the kind of most noble Corn-Law Dukes or Practical *Duces* we have, and also of right reverend Soul-Overseers, Christian Spiritual *Duces* 'on a minimum of four thousand five hundred,' one's hopes are a little chilled. Courage, nevertheless; there are many brave men in England! My indomitable Plugson, — nay is there

not even in thee some hope? Thou art hitherto a Bucanier, as it was written and prescribed for thee by an evil world: but in that grim brow, in that indomitable heart which *can* conquer Cotton, do there not perhaps lie other ten-times nobler conquests?

XXIV

Captains of Industry

By Thomas Carlyle [1]

If I believed that Mammonism with its adjuncts was to continue henceforth the one serious principle of our existence, I should reckon it idle to solicit remedial measures from any Government, the disease being insusceptible of remedy. Government can do much, but it can in no wise do all. Government, as the most conspicuous object in Society, is called upon to give signal of what shall be done; and, in many ways, to preside over, further, and command the doing of it. But the Government cannot do, by all its signaling and commanding, what the Society is radically indisposed to do. In the long-run every Government is the exact symbol of its People, with their wisdom and unwisdom; we have to say, Like People like Government. — The main substance of this immense Problem of Organising Labor, and first of all of Managing the Working Classes, will, it is very clear, have to be solved by those who stand practically in the middle of it; by those who themselves work and preside over work. Of all that can be enacted by any Parliament in regard to it, the germs must already lie potentially extant in those two Classes, who are to obey such enactment. A Human Chaos *in* which there is no light, you vainly attempt

1 See Note to Essay XXIII.

to irradiate by light shed *on* it: order never can arise there.

But it is my firm conviction that the 'Hell of England' will *cease* to be that of 'not making money;' that we shall get a nobler Hell and a nobler Heaven! I anticipate light *in* the Human Chaos, glimmering, shining more and more; under manifold true signals from without That light shall shine. Our deity no longer being Mammon, — O Heavens, each man will then say to himself: "Why such deadly haste to make money? I shall not go to Hell, even if I do not make money! There is another Hell, I am told!" Competition, at railway-speed, in all branches of commerce and work will then abate: — good felt-hats for the head, in every sense, instead of seven-feet lath-and-plaster hats on wheels, will then be discoverable! Bubble-periods, with their panics and commercial crises, will again become infrequent; steady modest industry will take the place of gambling speculation. To be a noble Master, among noble Workers, will again be the first ambition with some few; to be a rich Master only the second. How the Inventive Genius of England, with the whirr of its bobbins and billy-rollers shoved somewhat into the backgrounds of the brain, will contrive and devise, not cheaper produce exclusively, but fairer distribution of the produce at its present cheapness! By degrees, we shall again have a Society with something of Heroism in it, something of Heaven's Blessing on it; we shall again have, as my German friend asserts, 'instead of Mammon-Feudalism with unsold cotton-shirts and Preservation of the Game, noble just Industrialism and Government by the Wisest!'

It is with the hope of awakening here and there a British man to know himself for a man and divine soul, that a few words of parting admonition, to all persons to whom the Heavenly Powers have lent power of any kind in this land, may now be addressed. And first to those same Master-Workers, Leaders of Industry; who stand nearest and in fact powerfulest, though not most prominent, being as yet in too many senses a Virtuality rather than an Actuality.

The Leaders of Industry, if Industry is ever to be led, are virtually the Captains of the World; if there be no nobleness in them, there will never be an Aristocracy more. But let the Captains of Industry consider: once again, are they born of other clay than the old Captains of Slaughter; doomed forever to be no Chivalry, but a mere gold-plated *Doggery,*— what the French well named *Canaille,* 'Doggery' with more or less gold carrion at its disposal? Captains of Industry are the true Fighters, henceforth recognisable as the only true ones: Fighters against Chaos, Necessity and the Devils and Jötuns; and lead on Mankind in that great, and alone true, and universal warfare; the stars in their courses fighting for them, and all Heaven and all Earth saying audibly, Well done! Let the Captains of Industry retire into their own hearts, and ask solemnly, If there is nothing but vulturous hunger, for fine wines, valet reputation and gilt carriages, discoverable there? Of hearts made by the Almighty God I will not believe such a thing. Deep-hidden under wretchedest god-forgetting Cants, Epicurisms, Dead-Sea Apisms; forgotten as under foulest fat Lethe mud and weeds, there is yet, in all hearts born into this

God's-World, a spark of the Godlike slumbering. Awake, O nightmare sleepers; awake, arise, or be forever fallen! This is not playhouse poetry; it is sober fact. Our England, our world cannot live as it is. It will connect itself with a God again, or go down with nameless throes and fire-consummation to the Devils. Thou who feelest aught of such a Godlike stirring in thee, any faintest intimation of it as through heavy-laden dreams, follow *it,* I conjure thee. Arise, save thyself, be one of those that save thy country.

Bucaniers, Chactaw Indians, whose supreme aim in fighting is that they may get the scalps, the money, that they may amass scalps and money: out of such came no Chivalry, and never will! Out of such came only gore and wreck, infernal rage and misery; desperation quenched in annihilation. Behold it, I bid thee, behold there, and consider! What is it that thou have a hundred thousand-pound bills laid-up in thy strong-room, a hundred scalps hung-up in thy wigwam? I value not them or thee. Thy scalps and thy thousand-pound bills are as yet nothing, if no nobleness from within irradiate them; if no Chivalry, in action, or in embryo ever struggling towards birth and action, be there.

Love of men cannot be bought by cash-payment; and without love men cannot endure to be together. You cannot lead a Fighting World without having it regimented, chivalried: the thing, in a day, becomes impossible; all men in it, the highest at first, the very lowest at last, discern consciously, or by a noble instinct, this necessity. And can you any more continue to lead a Working World unregimented, anarchic? I answer, and the Heavens and Earth are now answering, No! The thing becomes not 'in a day' impos-

sible; but in some two generations it does. Yes, when fathers and mothers, in Stockport hunger-cellars, begin to eat their children, and Irish widows have to prove their relationship by dying of typhus-fever; and amid Governing 'Corporations of the Best and Bravest,' busy to preserve their game by 'bushing,' dark millions of God's human creatures start up in mad Chartisms, impracticable Sacred-Months, and Manchester Insurrections; — and there is a virtual Industrial Aristocracy as yet only half-alive, spell-bound amid money-bags and ledgers; and an actual Idle Aristocracy seemingly near dead in somnolent delusions, in trespasses and double-barrels; 'sliding,' as on inclined-planes, which every new year they *soap* with new Hansard's-jargon under God's sky, and so are 'sliding,' ever faster, towards a 'scale' and balance-scale whereon is written *Thou art found Wanting:* — in such days, after a generation or two, I say, it does become, even to the low and simple, very palpably impossible! No Working World, any more than a Fighting World, can be led on without a noble Chivalry of Work, and laws and fixed rules which follow out of that, — far nobler than any Chivalry of Fighting was. As an anarchic multitude on mere Supply-and-demand, it is becoming inevitable that we dwindle in horrid suicidal convulsion and self-abrasion, frightful to the imagination, into *Chactaw* Workers. With wigwams and scalps, — with palaces and thousand-pound bills; with savagery, depopulation, chaotic desolation! Good Heavens, will not one French Revolution and Reign of Terror suffice us, but must there be two? There will be two if needed; there will be twenty if needed; there will be precisely as many as are needed. The

Laws of Nature will have themselves fulfilled. That is a thing certain to me.

Your gallant battle-hosts and work-hosts, as the others did, will need to be made loyally yours; they must and will be regulated, methodically secured in their just share of conquest under you; — joined with you in veritable brotherhood, sonhood, by quite other and deeper ties than those of temporary day's wages! How would mere red-coated regiments, to say nothing of chivalries, fight for you, if you could discharge them on the evening of the battle, on payment of the stipulated shillings, — and they discharge you on the morning of it! Chelsea Hospitals, pensions, promotions, rigorous lasting covenant on the one side and on the other, are indispensable even for a hired fighter. The Feudal Baron, much more, — how could he subsist with mere temporary mercenaries round him, at sixpence a day; ready to go over to the other side, if sevenpence were offered? He could not have subsisted; — and his noble instinct saved him from the necessity of even trying! The Feudal Baron had a Man's Soul in him; to which anarchy, mutiny, and the other fruits of temporary mercenaries, were intolerable: he had never been a Baron otherwise, but had continued a Chactaw and Bucanier. He felt it precious, and at last it became habitual, and his fruitful enlarged existence included it as a necessity, to have men round him who in heart loved him; whose life he watched over with rigor yet with love; who were prepared to give their life for him, if need came. It was beautiful; it was human! Man lives not otherwise, nor can live contented, anywhere or anywhen. Isolation is the sum-total of wretchedness to man. To

be cut off, to be left solitary: to have a world alien, not your world; all a hostile camp for you; not a home at all, of hearts and faces who are yours, whose you are! It is the frightfulest enchantment; too truly a work of the Evil One. To have neither superior, nor inferior, nor equal, united manlike to you. Without father, without child, without brother. Man knows no sadder destiny. 'How is each of us,' exclaims Jean Paul, 'so lonely in the wide bosom of the All!' Encased each as in his transparent 'ice-palace;' our brother visible in his, making signals and gesticulations to us; — visible, but forever unattainable: on his bosom we shall never rest, nor he on ours. It was not a God that did this; no!

Awake, ye noble Workers, warriors in the one true war: all this must be remedied. It is you who are already half-alive, whom I will welcome into life; whom I will conjure, in God's name, to shake off your enchanted sleep, and live wholly! Cease to count scalps, gold-purses; not in these lies your or our salvation. Even these, if you count only these, will not long be left. Let bucaniering be put far from you; alter, speedily abrogate all laws of the bucaniers, if you would gain any victory that shall endure. Let God's justice, let pity, nobleness and manly valor, with more gold-purses or with fewer, testify themselves in this your brief Life-transit to all the Eternities, the Gods and Silences. It is to you I call; for ye are not dead, ye are already half-alive: there is in you a sleepless dauntless energy, the prime-matter of all nobleness in man. Honor to you in your kind. It is to you I call: ye know at least this, That the mandate of God to His creature man is: Work! The future

Epic of the World rests not with those that are near dead, but with those that are alive, and those that are coming into life.

Look around you. Your world-hosts are all in mutiny, in confusion, destitution; on the eve of fiery wreck and madness! They will not march farther for you, on the sixpence a day and supply-and-demand principle: they will not; nor ought they, nor can they. Ye shall reduce them to order, begin reducing them. To order, to just subordination; noble loyalty in return for noble guidance. Their souls are driven nigh mad; let yours be sane and ever saner. Not as a bewildered bewildering mob; but as a firm regimented mass, with real captains over them, will these men march any more. All human interests, combined human endeavors, and social growths in this world, have, at a certain stage of their development, required organising: and Work, the grandest of human interests, does now require it.

God knows, the task will be hard: but no noble task was ever easy. This task will wear away your lives, and the lives of your sons and grandsons: but for what purpose, if not for tasks like this, were lives given to men? Ye shall cease to count your thousand-pound scalps, the noble of you shall cease! Nay the very scalps, as I say, will not long be left if you count only these. Ye shall cease wholly to be barbarous vulturous Chactaws, and become noble European Nineteenth-Century Men. Ye shall know that Mammon, in never such gigs and flunky 'respectabilities,' is not the alone God; that of himself he is but a Devil, and even a Brute-god.

Difficult? Yes, it will be difficult. The short-fibre

cotton; that too was difficult. The waste cotton-shrub, long useless, disobedient, as the thistle by the wayside, — have ye not conquered it; made it into beautiful bandana webs; white woven shirts for men; bright-tinted air-garments wherein flit goddesses? Ye have shivered mountains asunder, made the hard iron pliant to you as soft putty: the Forest-giants, Marsh-jötuns bear sheaves of golden grain; Ægir the Sea-demon himself stretches his back for a sleek highway to you, and on Fire-horses and Wind-horses ye career. Ye are most strong. Thor red-bearded, with his blue sun-eyes, with his cheery heart and strong thunder-hammer, he and you have prevailed. Ye are most strong, ye Sons of the icy North, of the far East, — far marching from your rugged Eastern Wildernesses, hitherward from the gray Dawn of Time! Ye are Sons of the *Jötun*-land; the land of Difficulties Conquered. Difficult? You must try this thing. Once try it with the understanding that it will and shall have to be done. Try it as ye try the paltrier thing, making of money! I will bet on you once more, against all Jötuns, Tailor-gods, Double-barrelled Law-wards, and Denizens of Chaos whatsoever!

XXV

Permanence

By Thomas Carlyle [1]

STANDING on the threshold, nay as yet outside the threshold, of a 'Chivalry of Labor,' and an immeasurable Future which it is to fill with fruitfulness and verdant shade; where so much has not yet come even to the rudimental state, and all speech of positive enactments were hazardous in those who know this business only by the eye, — let us here hint at simply one widest universal principle, as the basis from which all organisation hitherto has grown up among men, and all henceforth will have to grow: The principle of Permanent Contract instead of Temporary.

Permanent not Temporary: — you do not hire the mere redcoated fighter by the day, but by the score of years! Permanence, persistence is the first condition of all fruitfulness in the ways of men. The 'tendency to persevere,' to persist in spite of hindrances, discouragements and 'impossibilities:' it is this that in all things distinguishes the strong soul from the weak; the civilised burgher from the nomadic savage, — the Species Man from the Genus Ape! The Nomad has his very house set on wheels; the Nomad,

1 See Note to Essay XXIII.

and in a still higher degree the Ape, are all for 'liberty;' the privilege to flit continually is indispensable for them. Alas, in how many ways, does our humor, in this swift-rolling, self-abrading Time, show itself nomadic, apelike; mournful enough to him that looks on it with eyes! This humor will have to abate; it is the first element of all fertility in human things, that such 'liberty' of apes and nomads do by freewill or constraint abridge itself, give place to a better. The civilised man lives not in wheeled houses. He builds stone castles, plants lands, makes lifelong marriage-contracts; — has long-dated hundred-fold possessions, not to be valued in the money-market; has pedigrees, libraries, law-codes; has memories and hopes, even for this Earth, that reach over thousands of years. Life-long marriage-contracts: how much preferable were year-long or month-long — to the nomad or ape!

Month-long contracts please me little, in any province where there can by possibility be found virtue enough for more. Month-long contracts do not answer well even with your house-servants; the liberty on both sides to change every month is growing very apelike, nomadic; — and I hear philosophers predict that it will alter, or that strange results will follow: that wise men, pestered with nomads, with unattached ever-shifting spies and enemies rather than friends and servants, will gradually, weighing substance against semblance, with indignation, dismiss such, down almost to the very shoeblack, and say, "Begone; I will serve myself rather, and have peace!" Gurth was hired for life to Cedric, and Cedric to Gurth. O Anti-Slavery Convention, loud-sounding long-eared Exeter-Hall — But in thee too is a kind of instinct towards justice,

and I will complain of nothing. Only black Quashee over the seas being once sufficiently attended to, wilt thou not perhaps open thy dull sodden eyes to the 'sixty-thousand valets in London itself who are yearly dismissed to the streets, to be what they can, when the season ends;' — or to the hunger-stricken, pallid, *yellow*-colored 'Free Laborers' in Lancashire, Yorkshire, Buckinghamshire, and all other shires! These Yellow-colored, for the present, absorb all my sympathies: if I had a Twenty Millions, with Model-Farms and Niger Expeditions, it is to these that I would give it! Quashee has already victuals, clothing; Quashee is not dying of such despair as the yellow-colored pale man's. Quashee, it must be owned, is hitherto a kind of blockhead. The Haiti Duke of Marmalade, educated now for almost half a century, seems to have next to no sense in him. Why, in one of those Lancashire Weavers, dying of hunger, there is more thought and heart, a greater arithmetical amount of misery and desperation, than in whole gangs of Quashees. It must be owned, thy eyes are of the sodden sort; and with thy emancipations, and thy twenty-millionings and long-eared clamorings, thou, like Robespierre with his paste-board *Être Suprême,* threatenest to become a bore to us: *Avec ton Être Suprême tu commences m'embêter!* —

In a Printed Sheet of the assiduous, much-abused, and truly useful Mr. Chadwick's, containing queries and responses from far and near as to this great question, 'What is the effect of education on working-men, in respect of their value as mere workers?' the present Editor, reading with satisfaction a decisive unanimous

verdict as to Education, reads with inexpressible interest this special remark, put in by way of marginal incidental note, from a practical manufacturing Quaker, whom, as he is anonymous, we will call Friend Prudence. Prudence keeps a thousand workmen; has striven in all ways to attach them to him; has provided conversational soirées; play-grounds, bands of music for the young ones; went even 'the length of buying them a drum:' all which has turned out to be an excellent investment. For a certain person, marked here by a black stroke, whom we shall name Blank, living over the way, — he also keeps somewhere about a thousand men; but has done none of these things for them, nor any other thing, except due payment of the wages by supply-and-demand. Blank's workers are perpetually getting into mutiny, into broils and coils: every six months, we suppose, Blank has a strike; every one month, every day and every hour, they are fretting and obstructing the shortsighted Blank; pilfering from him, wasting and idling for him, omitting and committing for him. "I would not," says Friend Prudence, "exchange my workers for his *with seven thousand pounds to boot.*" [1]

Right, O honorable Prudence; thou art wholly in the right: Seven thousand pounds even as a matter of profit for this world, nay for the mere cash-market of this world! And as a matter of profit not for this world only, but for the other world and all worlds, it outweighs the Bank of England! — Can the sagacious reader descry here, as it were the outmost inconsiderable rock-ledge of a universal rock-foundation, deep once more as the Centre of the World, emerging so, in

1 *Report on the Training of Pauper Children* (1841), p. 18.

the experience of this good Quaker, through the Stygian mud-vortexes and general Mother of Dead Dogs, whereon, for the present, all swags and insecurely hovers, as if ready to be swallowed?

Some Permanence of Contract is already almost possible; the principle of Permanence, year by year, better seen into and elaborated, may enlarge itself, expand gradually on every side into a system. This once secured, the basis of all good results were laid. Once permanent, you do not quarrel with the first difficulty on your path, and quit it in weak disgust; you reflect that it cannot be quitted, that it must be conquered, a wise arrangement fallen on with regard to it. Ye foolish Wedded Two, who have quarrelled, between whom the Evil Spirit has stirred-up transient strife and bitterness, so that 'incompatibility' seems almost nigh, ye are nevertheless the Two who, by long habit, were it by nothing more, do best of all others suit each other: it is expedient for your own two foolish selves, to say nothing of the infants, pedigrees and public in general, that ye agree again; that ye put away the Evil Spirit, and wisely on both hands struggle for the guidance of a Good Spirit!

The very horse that is permanent, how much kindlier do his rider and he work, than the temporary one, hired on any hack principle yet known! I am for permanence in all things, at the earliest possible moment, and to the latest possible. Blessed is he that continueth where he is. Here let us rest, and lay-out seedfields; here let us learn to dwell. Here, even here, the orchards that we plant will yield us fruit; the acorns will be wood and pleasant umbrage, if we wait. How much

grows everywhere, if we do but wait! Through the swamps we will shape causeways, force purifying drains; we will learn to thread the rocky inaccessibilities; and beaten tracks, worn smooth by mere travelling of human feet, will form themselves. Not a difficulty but can transfigure itself into a triumph; not even a deformity but, if our own soul have imprinted worth on it, will grow dear to us. The sunny plains and deep indigo transparent skies of Italy are all indifferent to the great sick heart of a Sir Walter Scott: on the back of the Apennines, in wild spring weather, the sight of bleak Scotch firs, and snow-spotted heath and desolation, brings tears into his eyes.[1]

O unwise mortals that forever change and shift, and say, Yonder, not Here! Wealth richer than both the Indies lies everywhere for man, if he will endure. Not his oaks only and his fruit-trees, his very heart roots itself wherever he will abide;— roots itself, draws nourishment from the deep fountains of Universal Being! Vagrant Sam-Slicks, who rove over the Earth doing 'strokes of trade,' what wealth have they? Horseloads, shiploads of white or yellow metal: in very sooth, what *are* these? Slick rests nowhere, he is homeless. He can build stone or marble houses; but to continue in them is denied him. The wealth of a man is the number of things which he loves and blesses, which he is loved and blessed by! The herdsman in his poor clay shealing, where his very cow and dog are friends to him, and not a cataract but carries memories for him, and not a mountain-top but nods old recognition: his life, all encircled as in blessed mother's-arms, is it poorer than Slick's with the ass-

1 Lockhart's *Life of Scott.*

loads of yellow metal on his back? Unhappy Slick! Alas, there has so much grown nomadic, apelike, with us: so much will have, with whatever pain, repugnance and 'impossibility,' to alter itself, to fix itself again — in some wise way, in any not delirious way!

A question arises here: Whether, in some ulterior, perhaps some not far-distant stage of this 'Chivalry of Labor,' your Master-Worker may not find it possible, and needful, to grant his Workers permanent *interest* in his enterprise and theirs? So that it become, in practical result, what in essential fact and justice it ever is, a joint enterprise; all men, from the Chief Master down to the lowest Overseer and Operative, economically as well as loyally concerned for it? — Which question I do not answer. The answer, near or else far, is perhaps, Yes; — and yet one knows the difficulties. Despotism is essential in most enterprises; I am told, they do not tolerate 'freedom of debate' on board a Seventy-four! Republican senate and *plebiscita* would not answer well in Cotton-Mills. And yet observe there too: Freedom, not nomad's or ape's Freedom, but man's Freedom; this is indispensable. We must have it, and will have it! To reconcile Despotism with Freedom: — well, is that such a mystery? Do you not already know the way? It is to make your Despotism *just*. Rigorous as Destiny; but just too, as Destiny and its Laws. The Laws of God: all men obey these, and have no 'Freedom' at all but in obeying them. The way is already known, part of the way; — and courage and some qualities are needed for walking on it!

XXVI

Traffic

By John Ruskin [1]

My good Yorkshire friends, you asked me down here among your hills that I might talk to you about this Exchange you are going to build: but, earnestly and seriously asking you to pardon me, I am going to do nothing of the kind. I cannot talk, or at least can say very little, about this same Exchange. I must talk of quite other things, though not willingly; — I could not deserve your pardon, if, when you invited me to speak on one subject, I *wilfully* spoke on another. But I cannot speak, to purpose, of anything about which I do not care; and most simply and sorrowfully I have to tell you, in the outset, that I do *not* care about this Exchange of yours.

If, however, when you sent me your invitation, I had answered, "I won't come, I don't care about the Exchange of Bradford," you would have been justly offended with me, not knowing the reasons of so blunt a carelessness. So I have come down, hoping that you will patiently let me tell you why, on this, and many other such occasions, I now remain silent, when

1 This lecture was delivered in the Town Hall, Bradford, April 21, 1864, and was included by Ruskin in the *Crown of Wild Olive*, 1866. For a brief account of Ruskin see Note to the first essay in this volume. Ruskin's footnotes, where they are not necessary to an understanding of the text, have been omitted.—Editor.

formerly I should have caught at the opportunity of speaking to a gracious audience.

In a word, then, I do not care about this Exchange — because *you* don't; and because you know perfectly well I cannot make you. Look at the essential conditions of the case, which you, as business men, know perfectly well, though perhaps you think I forget them. You are going to spend £30,000, which to you, collectively, is nothing; the buying a new coat is, as to the cost of it, a much more important matter of consideration to me, than building a new Exchange is to you. But you think you may as well have the right thing for your money. You know there are a great many odd styles of architecture about; you don't want to do anything ridiculous; you hear of me, among others, as a respectable architectural man-milliner; and you send for me, that I may tell you the leading fashion; and what is, in our shops, for the moment, the newest and sweetest thing in pinnacles.

Now, pardon me for telling you frankly, you cannot have good architecture merely by asking people's advice on occasion. All good architecture is the expression of national life and character; and it is produced by a prevalent and eager national taste, or desire for beauty. And I want you to think a little of the deep significance of this word "taste"; for no statement of mine has been more earnestly or oftener controverted than that good taste is essentially a moral quality. "No," say many of my antagonists, "taste is one thing, morality is another. Tell us what is pretty: we shall be glad to know that; but we need no sermons — even were you able to preach them, which may be doubted."

Permit me, therefore, to fortify this old dogma of

mine somewhat. Taste is not only a part and an index of morality; — it is the ONLY morality. The first, and last, and closest trial question to any living creature is, "What do you like?" Tell me what you like, and I'll tell you what you are. Go out into the street, and ask the first man or woman you meet, what their "taste" is; and if they answer candidly, you know them, body and soul. "You, my friend in the rags, with the unsteady gait, what do *you* like?" "A pipe, and a quartern of gin." I know you. "You, good woman, with the quick step and tidy bonnet, what do you like?" "A swept hearth, and a clean tea-table; and my husband opposite me, and a baby at my breast." Good, I know you also. "You, little girl with the golden hair and the soft eyes, what do you like?" "My canary, and a run among the wood hyacinths." "You, little boy with the dirty hands, and the low forehead, what do you like?" "A shy at the sparrows, and a game at pitchfarthing." Good; we know them all now. What more need we ask?

"Nay," perhaps you answer; "we need rather to ask what these people and children do, than what they like. If they *do* right, it is no matter that they like what is wrong; and if they *do* wrong, it is no matter that they like what is right. Doing is the great thing; and it does not matter that the man likes drinking, so that he does not drink; nor that the little girl likes to be kind to her canary, if she will not learn her lessons; nor that the little boy likes throwing stones at the sparrows, if he goes to the Sunday school." Indeed, for a short time, and in a provisional sense, this is true. For if, resolutely, people do what is right, in time to come they like doing it. But they only are in a right

moral state when they *have* come to like doing it; and as long as they don't like it, they are still in a vicious state. The man is not in health of body who is always thinking of the bottle in the cupboard, though he bravely bears his thirst; but the man who heartily enjoys water in the morning, and wine in the evening, each in its proper quantity and time. And the entire object of true education is to make people not merely *do* the right things, but *enjoy* the right things: — not merely industrious, but to love industry — not merely learned, but to love knowledge — not merely pure, but to love purity — not merely just, but to hunger and thirst after justice.

But you may answer or think, "Is the liking for outside ornaments,— for pictures, or statues, or furniture, or architecture,— a moral quality?" Yes, most surely, if a rightly set liking. Taste for *any* pictures or statues is not a moral quality, but taste for good ones is. Only here again we have to define the word "good." I don't mean by "good," clever — or learned — or difficult in the doing. Take a picture by Teniers, of sots quarreling over their dice; it is an entirely clever picture; so clever that nothing in its kind has ever been done equal to it; but it is also an entirely base and evil picture. It is an expression of delight in the prolonged contemplation of a vile thing, and delight in that is an "unmannered," or "immoral" quality. It is "bad taste" in the profoundest sense — it is the taste of the devils. On the other hand, a picture of Titian's, or a Greek statue, or a Greek coin, or a Turner landscape, expresses delight in the perpetual contemplation of a good and perfect thing. That is an entirely moral quality — it is the taste of the angels.

And all delight in fine art, and all love of it, resolve themselves into simple love of that which deserves love. That deserving is the quality which we call "loveliness" — (we ought to have an opposite word, hateliness, to be said of the things which deserve to be hated); and it is not an indifferent nor optional thing whether we love this or that; but it is just the vital function of all our being. What we *like* determines what we *are,* and is the sign of what we are; and to teach taste is inevitably to form character.

As I was thinking over this, in walking up Fleet Street the other day, my eye caught the title of a book standing open in a bookseller's window. It was — "On the necessity of the diffusion of taste among all classes." "Ah," I thought to myself, "my classifying friend, when you have diffused your taste, where will your classes be? The man who likes what you like, belongs to the same class with you, I think. Inevitably so. You may put him to other work if you choose; but, by the condition you have brought him into, he will dislike the work as much as you would yourself. You get hold of a scavenger or a costermonger, who enjoyed the Newgate Calendar for literature, and 'Pop goes the Weasel' for music. You think you can make him like Dante and Beethoven? I wish you joy of your lessons; but if you do, you have made a gentleman of him: — he won't like to go back to his costermongering."

And so completely and unexceptionally is this so, that, if I had time to-night, I could show you that a nation cannot be affected by any vice, or weakness, without expressing it, legibly, and for ever, either in bad art, or by want of art; and that there is no national

virtue, small or great, which is not manifestly expressed in all the art which circumstances enable the people possessing that virtue to produce. Take, for instance, your great English virtue of enduring and patient courage. You have at present in England only one art of any consequence — that is, iron-working. You know thoroughly well how to cast and hammer iron. Now, do you think, in those masses of lava which you build volcanic cones to melt, and which you forge at the mouths of the Infernos you have created; do you think, on those iron plates, your courage and endurance are not written for ever,— not merely with an iron pen, but on iron parchment? And take also your great English vice — European vice — vice of all the world — vice of all other worlds that roll or shine in heaven, bearing with them yet the atmosphere of hell — the vice of jealousy, which brings competition into your commerce, treachery into your councils, and dishonor into your wars — that vice which has rendered for you, and for your next neighboring nation, the daily occupations of existence no longer possible, but with the mail upon your breasts and the sword loose in its sheath; so that at last, you have realised for all the multitudes of the two great peoples who lead the so-called civilisation of the earth, — you have realised for them all, I say, in person and in policy, what was once true only of the rough Border riders of your Cheviot hills —

> "They carved at the meal
> With gloves of steel,
> And they drank the red wine through the helmet barr'd;"—

do you think that this national shame and dastardliness of heart are not written as legibly on every rivet of your

iron armor as the strength of the right hands that forged it?

Friends, I know not whether this thing be the more ludicrous or the more melancholy. It is quite unspeakably both. Suppose, instead of being now sent for by you, I had been sent for by some private gentleman, living in a suburban house, with his garden separated only by a fruit wall from his next door neighbor's; and he had called me to consult with him on the furnishing of his drawing-room. I begin looking about me, and find the walls rather bare; I think such and such a paper might be desirable — perhaps a little fresco here and there on the ceiling — a damask curtain or so at the windows. "Ah," says my employer, "damask curtains, indeed! That's all very fine, but you know I can't afford that kind of thing just now!" "Yet the world credits you with a splendid income!" "Ah, yes," says my friend, "but do you know, at present I am obliged to spend it nearly all in steel-traps?" "Steel-traps! for whom?" "Why, for that fellow on the other side the wall, you know: we're very good friends, capital friends; but we are obliged to keep our traps set on both sides of the wall; we could not possibly keep on friendly terms without them, and our spring guns. The worst of it is, we are both clever fellows enough; and there's never a day passes that we don't find out a new trap, or a new gun-barrel, or something; we spend about fifteen millions a year each in our traps, take it altogether; and I don't see how we're to do with less." A highly comic state of life for two private gentlemen! but for two nations, it seems to me, not wholly comic. Bedlam would be comic, perhaps, if there were only one madman in it;

and your Christmas pantomime is comic, when there is only one clown in it; but when the whole world turns clown, and paints itself red with its own heart's blood instead of vermilion, it is something else than comic, I think.

Mind, I know a great deal of this is play, and willingly allow for that. You don't know what to do with yourselves for a sensation: fox-hunting and cricketing will not carry you through the whole of this unendurably long mortal life: you liked pop-guns when you were schoolboys, and rifles and Armstrongs are only the same things better made: but then the worst of it is, that what was play to you when boys, was not play to the sparrows; and what is play to you now, is not play to the small birds of State neither; and for the black eagles, you are somewhat shy of taking shots at them, if I mistake not.

I must get back to the matter in hand, however. Believe me, without farther instance, I could show you, in all time, that every nation's vice, or virtue, was written in its art: the soldiership of early Greece; the sensuality of late Italy; the visionary religion of Tuscany; the splendid human energy of Venice. I have no time to do this to-night (I have done it elsewhere before now); but I proceed to apply the principle to ourselves in a more searching manner.

I notice that among all the new buildings which cover your once wild hills, churches and schools are mixed in due, that is to say, in large proportion, with your mills and mansions; and I notice also that the churches and schools are almost always Gothic, and the mansions and mills are never Gothic. May I ask the meaning of this? for, remember, it is peculiarly a

modern phenomenon. When Gothic was invented, houses were Gothic as well as churches; and when the Italian style superseded the Gothic, churches were Italian as well as houses. If there is a Gothic spire to the cathedral of Antwerp, there is a Gothic belfry to the Hôtel de Ville at Brussels; if Inigo Jones builds an Italian Whitehall, Sir Christopher Wren builds an Italian St. Paul's. But now you live under one school of architecture, and worship under another. What do you mean by doing this? Am I to understand that you are thinking of changing your architecture back to Gothic; and that you treat your churches experimentally, because it does not matter what mistakes you make in a church? Or am I to understand that you consider Gothic a pre-eminently sacred and beautiful mode of building, which you think, like the fine frankincense, should be mixed for the tabernacle only, and reserved for your religious services? For if this be the feeling, though it may seem at first as if it were graceful and reverent, at the root of the matter, it signifies neither more nor less than that you have separated your religion from your life.

. . . . . .

"But what has all this to do with our Exchange?" you ask me, impatiently. My dear friends, it has just everything to do with it; on these inner and great questions depend all the outer and little ones; and if you have asked me down here to speak to you, because you had before been interested in anything I have written, you must know that all I have yet said about architecture was to show this. The book I called *The Seven Lamps* was to show that certain right states of temper and moral feeling were the magic powers by

which all good architecture, without exception, had been produced. *The Stones of Venice* had, from beginning to end, no other aim than to show that the Gothic architecture of Venice had arisen out of, and indicated in all its features, a state of pure national faith, and of domestic virtue; and that its Renaissance architecture had arisen out of, and in all its features indicated, a state of concealed national infidelity, and of domestic corruption. And now, you ask me what style is best to build in, and how can I answer, knowing the meaning of the two styles, but by another question — do you mean to build as Christians or as Infidels? And still more — do you mean to build as honest Christians or as honest Infidels? as thoroughly and confessedly either one or the other? You don't like to be asked such rude questions. I cannot help it; they are of much more importance than this Exchange business; and if they can be at once answered, the Exchange business settles itself in a moment. But before I press them farther, I must ask leave to explain one point clearly.

In all my past work, my endeavor has been to show that good architecture is essentially religious — the production of a faithful and virtuous, not of an infidel and corrupted people. But in the course of doing this, I have had also to show that good architecture is not *ecclesiastical.* People are so apt to look upon religion as the business of the clergy, not their own, that the moment they hear of anything depending on "religion," they think it must also have depended on the priesthood; and I have had to take what place was to be occupied between these two errors, and fight both, often

with seeming contradiction. Good architecture is the work of good and believing men; therefore, you say, at least some people say, "Good architecture must essentially have been the work of the clergy, not of the laity." No — a thousand times no; good architecture has always been the work of the commonalty, *not* of the clergy. "What," you say, "those glorious cathedrals — the pride of Europe — did their builders not form Gothic architecture?" No; they corrupted Gothic architecture. Gothic was formed in the baron's castle, and the burgher's street. It was formed by the thoughts, and hands, and powers of laboring citizens and warrior kings. By the monk it was used as an instrument for the aid of his superstition: when that superstition became a beautiful madness, and the best hearts of Europe vainly dreamed and pined in the cloister, and vainly raged and perished in the crusade, — through that fury of perverted faith and wasted war, the Gothic rose also to its loveliest, most fantastic, and, finally, most foolish dreams; and in those dreams was lost.

I hope, now, that there is no risk of your misunderstanding me when I come to the gist of what I want to say to-night; — when I repeat, that every great national architecture has been the result and exponent of a great national religion. You can't have bits of it here, bits there — you must have it everywhere or nowhere. It is not the monopoly of a clerical company — it is not the exponent of a theological dogma — it is not the hieroglyphic writing of an initiated priesthood; it is the manly language of a people inspired by resolute and common purpose, and rendering resolute

and common fidelity to the legible laws of an undoubted God.

. . . . . .

You know we are speaking always of the real, active, continual, national worship; that by which men act, while they live; not that which they talk of, when they die. Now, we have, indeed, a nominal religion, to which we pay tithes of property and sevenths of time; but we have also a practical and earnest religion, to which we devote nine-tenths of our property and six-sevenths of our time. And we dispute a great deal about the nominal religion: but we are all unanimous about this practical one; of which I think you will admit that the ruling goddess may be best generally described as the "Goddess of Getting-on," or "Britannia of the Market." The Athenians had an "Athena Agoraia," or Athena of the Market; but she was a subordinate type of their goddess, while our Britannia Agoraia is the principal type of ours. And all your great architectural works are, of course, built to her. It is long since you built a great cathedral; and how you would laugh at me if I proposed building a cathedral on the top of one of these hills of yours, to make it an Acropolis! But your railroad mounds, vaster than the walls of Babylon; your railroad stations, vaster than the temple of Ephesus, and innumerable; your chimneys, how much more mighty and costly than cathedral spires! your harbor-piers; your warehouses; your exchanges! — all these are built to your great Goddess of "Getting-on"; and she has formed, and will continue to form, your architecture, as long as you worship her; and it is quite vain to ask me to tell you how to build to *her;* you know far better than I.

There might, indeed, on some theories, be a conceivably good architecture for Exchanges — that is to say, if there were any heroism in the fact or deed of exchange, which might be typically carved on the outside of your building. For, you know, all beautiful architecture must be adorned with sculpture or painting; and for sculpture or painting, you must have a subject. And hitherto it has been a received opinion among the nations of the world that the only right subjects for either, were *heroisms* of some sort. Even on his pots and his flagons, the Greek put a Hercules slaying lions, or an Apollo slaying serpents, or Bacchus slaying melancholy giants, and earthborn despondencies. On his temples, the Greek put contests of great warriors in founding states, or of gods with evil spirits. On his houses and temples alike, the Christian put carvings of angels conquering devils; or of heromartyrs exchanging this world for another: subject inappropriate, I think, to our direction of exchange here. And the Master of Christians not only left His followers without any orders as to the sculpture of affairs of exchange on the outside of buildings, but gave some strong evidence of His dislike of affairs of exchange within them. And yet there might surely be a heroism in such affairs; and all commerce become a kind of selling of doves, not impious. The wonder has always been great to me, that heroism has never been supposed to be in anywise consistent with the practice of supplying people with food, or clothes; but rather with that of quartering oneself upon them for food, and stripping them of their clothes. Spoiling of armor is an heroic deed in all ages; but the selling of clothes, old, or new, has never taken any color of magnanimity.

Yet one does not see why feeding the hungry and clothing the naked should ever become base businesses, even when engaged in on a large scale. If one could contrive to attach the notion of conquest to them anyhow! so that, supposing there were anywhere an obstinate race, who refused to be comforted, one might take some pride in giving them compulsory comfort! and, as it were, "*occuping* a country" with one's gifts, instead of one's armies? If one could only consider it as much a victory to get a barren field sown, as to get an eared field stripped; and contend who should build villages, instead of who should "carry" them! Are not all forms of heroism conceivable in doing these serviceable deeds? You doubt who is strongest? It might be ascertained by push of spade, as well as push of sword. Who is wisest? There are witty things to be thought of in planning other business than campaigns. Who is bravest? There are always the elements to fight with, stronger than men; and nearly as merciless.

The only absolutely and unapproachably heroic element in the soldier's work seems to be — that he is paid little for it — and regularly: while you traffickers, and exchangers, and others occupied in presumably benevolent business, like to be paid much for it — and by chance. I never can make out how it is that a *knight*-errant does not expect to be paid for his trouble, but a *pedlar*-errant always does; — that people are willing to take hard knocks for nothing, but never to sell ribands cheap; that they are ready to go on fervent crusades, to recover the tomb of a buried God, but never on any travels to fulfil the orders of a living one; — that they will go anywhere barefoot to preach their faith, but must be well bribed to practise it, and are perfectly

ready to give the Gospel gratis, but never the loaves and fishes.

If you chose to take the matter up on any such soldierly principle; to do your commerce, and your feeding of nations, for fixed salaries; and to be as particular about giving people the best food, and the best cloth, as soldiers are about giving them the best gunpowder, I could carve something for you on your exchange worth looking at. But I can only at present suggest decorating its frieze with pendant purses; and making its pillars broad at the base, for the sticking of bills. And in the innermost chambers of it there might be a statue of Britannia of the Market, who may have, perhaps advisably, a partridge for her crest, typical at once of her courage in fighting for noble ideas, and of her interest in game; and round its neck, the inscription in golden letters, "Perdix fovit quæ non peperit."[1] Then, for her spear, she might have a weaver's beam; and on her shield, instead of St. George's Cross, the Milanese boar, semi-fleeced, with the town of Gennesaret proper, in the field; and the legend, "In the best market," and her corslet, of leather, folded over her heart in the shape of a purse, with thirty slits in it, for a piece of money to go in at, on each day of the month. And I doubt not but that people would come to see your exchange, and its goddess, with applause.

Nevertheless, I want to point out to you certain strange characters in this goddess of yours. She differs from the great Greek and Mediæval deities essen-

1 Jerem. xvii. 11, (best in Septuagint and Vulgate). "As the partridge, fostering what she brought not forth, so he that getteth riches, not by right, shall leave them in the midst of his days, and at his end shall be a fool."

tially in two things — first, as to the continuance of her presumed power; secondly, as to the extent of it.

1st, as to the Continuance.

The Greek Goddess of Wisdom gave continual increase of wisdom, as the Christian Spirit of Comfort (or Comforter) continual increase of comfort. There was no question, with these, of any limit or cessation of function. But with your Agora Goddess, that is just the most important question. Getting on — but where to? Gathering together — but how much? Do you mean to gather always — never to spend? If so, I wish you joy of your goddess, for I am just as well off as you, without the trouble of worshipping her at all. But if you do not spend, somebody else will — somebody else must. And it is because of this (among many other such errors) that I have fearlessly declared your so-called science of Political Economy to be no science; because, namely, it has omitted the study of exactly the most important branch of the business — the study of *spending*. For spend you must, and as much as you make, ultimately. You gather corn: — will you bury England under a heap of grain; or will you, when you have gathered, finally eat? You gather gold: — will you make your house-roofs of it, or pave your streets with it? That is still one way of spending it. But if you keep it, that you may get more, I'll give you more; I'll give you all the gold you want — all you can imagine — if you can tell me what you'll do with it. You shall have thousands of gold pieces; — thousands of thousands — millions — mountains, of gold: where will you keep them? Will you put an Olympus of silver upon a golden Pelion — make Ossa like a wart? Do you think the rain and dew would

then come down to you, in the streams from such mountains, more blessedly than they will down the mountains which God has made for you, of moss and whinstone? But it is not gold that you want to gather! What is it? greenbacks? No; not those neither. What is it then — is it ciphers after a capital I? Cannot you practice writing ciphers, and write as many as you want! Write ciphers for an hour every morning, in a big book, and say every evening, I am worth all those noughts more than I was yesterday. Won't that do? Well, what in the name of Plutus is it you want? Not gold, not greenbacks, not ciphers after a capital I? You will have to answer, after all, "No; we want, somehow or other, money's *worth*." Well, what is that? Let your Goddess of Getting-on discover it, and let her learn to stay therein.

II. But there is yet another question to be asked respecting this Goddess of Getting-on. The first was of the continuance of her power; the second is of its extent.

Pallas and the Madonna were supposed to be all the world's Pallas, and all the world's Madonna. They could teach all men, and they could comfort all men. But, look strictly into the nature of the power of your Goddess of Getting-on; and you will find she is the Goddess — not of everybody's getting on — but only of somebody's getting on. This is a vital, or rather deathful, distinction. Examine it in your own ideal of the state of national life which this Goddess is to evoke and maintain. I asked you what it was, when I was last here;[1] — you have never told me. Now, shall I try to tell you?

1 *The Two Paths.*

Your ideal of human life then is, I think, that it should be passed in a pleasant undulating world, with iron and coal everywhere underneath it. On each pleasant bank of this world is to be a beautiful mansion, with two wings; and stables, and coach-houses; a moderately-sized park; a large garden and hot-houses; and pleasant carriage drives through the shrubberies. In this mansion are to live the favored votaries of the Goddess; the English gentleman, with his gracious wife, and his beautiful family; he always able to have the boudoir and the jewels for the wife, and the beautiful ball dresses for the daughters, and hunters for the sons, and a shooting in the Highlands for himself. At the bottom of the bank, is to be the mill; not less than a quarter of a mile long, with one steam engine at each end, and two in the middle, and a chimney three hundred feet high. In this mill are to be in constant employment from eight hundred to a thousand workers, who never drink, never strike, always go to church on Sunday, and always express themselves in respectful language.

Is not that, broadly, and in the main features, the kind of thing you propose to yourselves? It is very pretty indeed, seen from above; not at all so pretty, seen from below. For, observe, while to one family this deity is indeed the Goddess of Getting-on, to a thousand families she is the Goddess of *not* Getting-on. "Nay," you say, "they have all their chance." Yes, so has every one in a lottery, but there must always be the same number of blanks. "Ah! but in a lottery it is not skill and intelligence which take the lead, but blind chance." What then! do you think the old practice, that "they should take who have the power,

and they should keep who can," is less iniquitous, when the power has become power of brains instead of fist? and that, though we may not take advantage of a child's or a woman's weakness, we may of a man's foolishness? "Nay, but finally, work must be done, and some one must be at the top, some one at the bottom." Granted, my friends. Work must always be, and captains of work must always be; and if you in the least remember the tone of any of my writings, you must know that they are thought unfit for this age, because they are always insisting on need of government, and speaking with scorn of liberty. But I beg you to observe that there is a wide difference between being captains or governors of work, and taking the profits of it. It does not follow, because you are general of an army, that you are to take all the treasure, or land, it wins (if it fight for treasure or land); neither, because you are king of a nation, that you are to consume all the profits of the nation's work. Real kings, on the contrary, are known invariably by their doing quite the reverse of this,— by their taking the least possible quantity of the nation's work for themselves. There is no test of real kinghood so infallible as that. Does the crowned creature live simply, bravely, unostentatiously? probably he *is* a King. Does he cover his body with jewels, and his table with delicates? in all probability he is *not* a King. It is possible he may be, as Solomon was; but that is when the nation shares his splendor with him. Solomon made gold, not only to be in his own palace as stones, but to be in Jerusalem as stones. But, even so, for the most part, these splendid kinghoods expire in ruin, and only the true kinghoods live, which are of royal laborers governing

loyal laborers; who, both leading rough lives, establish the true dynasties. Conclusively you will find that because you are king of a nation, it does not follow that you are to gather for yourself all the wealth of that nation; neither, because you are king of a small part of the nation, and lord over the means of its maintenance — over field, or mill, or mine,— are you to take all the produce of that piece of the foundation of national existence for yourself.

You will tell me I need not preach against these things, for I cannot mend them. No, good friends, I cannot; but you can, and you will; or something else can and will. Even good things have no abiding power — and shall these evil things persist in victorious evil? All history shows, on the contrary, that to be the exact thing they never can do. Change *must* come; but it is ours to determine whether change of growth, or change of death. Shall the Parthenon be in ruins on its rock, and Bolton priory in its meadow, but these mills of yours be the consummation of the buildings of the earth, and their wheels be as the wheels of eternity? Think you that "men may come, and men may go," but — mills — go on for ever? Not so; out of these, better or worse shall come; and it is for you to choose which.

I know that none of this wrong is done with deliberate purpose. I know, on the contrary, that you wish your workmen well; that you do much for them, and that you desire to do more for them, if you saw your way to such benevolence safely. I know that even all this wrong and misery are brought about by a warped sense of duty, each of you striving to do his best; but, unhappily, not knowing for whom this best should

be done. And all our hearts have been betrayed by the plausible impiety of the modern economist, telling us that, "To do the best for ourselves, is finally to do the best for others." Friends, our great Master said not so; and most absolutely we shall find this world is not made so. Indeed, to do the best for others, is finally to do the best for ourselves; but it will not do to have our eyes fixed on that issue. The Pagans had got beyond that. Hear what a Pagan says of this matter; hear what were, perhaps, the last written words of Plato,— if not the last actually written (for this we cannot know), yet assuredly in fact and power his parting words — in which, endeavoring to give full crowning and harmonious close to all his thoughts, and to speak the sum of them by the imagined sentence of the Great Spirit, his strength and his heart fail him, and the words cease, broken off for ever.

They are at the close of the dialogue called *Critias,* in which he describes, partly from real tradition, partly in ideal dream, the early state of Athens; and the genesis, and order, and religion, of the fabled isle of Atlantis; in which genesis he conceives the same first perfection and final degeneracy of man, which in our own Scriptural tradition is expressed by saying that the Sons of God inter-married with the daughters of men, for he supposes the earliest race to have been indeed the children of God; and to have corrupted themselves, until "their spot was not the spot of his children." And this, he says, was the end; that indeed "through many generations, so long as the God's nature in them yet was full, they were submissive to the sacred laws, and carried themselves lovingly to all that had kindred with them in divineness; for their

uttermost spirit was faithful and true, and in every wise great; so that, in *all meekness of wisdom they dealt with each other,* and took all the chances of life; and despising all things except virtue, they cared little what happened day by day, and *bore lightly the burden* of gold and of possessions; for they saw that, if *only their common love and virtue increased, all these things would be increased together with them;* but to set their esteem and ardent pursuit upon material possession would be to lose that first, and their virtue and affection together with it. And by such reasoning, and what of the divine nature remained in them, they gained all this greatness of which we have already told; but when the God's part of them faded and became extinct, being mixed again and again, and effaced by the prevalent mortality; and the human nature at last exceeded, they then became unable to endure the courses of fortune; and fell into shapelessness of life, and baseness in the sight of him who could see, having lost everything that was fairest of their honor; while to the blind hearts which could not discern the true life, tending to happiness, it seemed that they were then chiefly noble and happy, being filled with all iniquity of inordinate possession and power. Whereupon, the God of Gods, whose Kinghood is in laws, beholding a once just nation thus cast into misery, and desiring to lay such punishment upon them as might make them repent into restraining, gathered together all the gods into his dwelling place, which from heaven's centre overlooks whatever has part in creation; and having assembled them, he said "——

The rest is silence. Last words of the chief wisdom of the heathen, spoken of this idol of riches; this idol

of yours; this golden image, high by measureless cubits, set up where your green fields of England are furnace-burnt into the likeness of the plain of Dura: this idol, forbidden to us, first of all idols, by our own Master and faith; forbidden to us also by every human lip that has ever, in any age or people, been accounted of as able to speak according to the purposes of God. Continue to make that forbidden deity your principal one, and soon no more art, no more science, no more pleasure will be possible. Catastrophe will come; or, worse than catastrophe, slow mouldering and withering into Hades. But if you can fix some conception of a true human state of life to be striven for — life, good for all men, as for yourselves; if you can determine some honest and simple order of existence; following those trodden ways of wisdom, which are pleasantness, and seeking her quiet and withdrawn paths, which are peace; — then, and so sanctifying wealth into "commonwealth," all your art, your literature, your daily labors, your domestic affection, and citizen's duty, will join and increase into one magnificent harmony. You will know then how to build, well enough; you will build with stone well, but with flesh better; temples not made with hands, but riveted of hearts; and that kind of marble, crimson-veined, is indeed eternal.

XXVII

The Mystery of Life and Its Arts

By John Ruskin [1]

When I accepted the privilege of addressing you today, I was not aware of a restriction with respect to the topics of discussion which may be brought before this Society,[2] — a restriction which, though entirely wise and right under the circumstances contemplated in its introduction, would necessarily have disabled me, thinking as I think, from preparing any lecture for you on the subject of art in a form which might be permanently useful. Pardon me, therefore, in so far as I must transgress such limitation; for indeed my infringement will be of the letter — not of the spirit — of your commands. In whatever I may say touching the religion which has been the foundation of art, or the policy which has contributed to its power, if I offend one, I shall offend all; for I shall take no note of any separations in creeds, or antagonisms in parties: neither do I fear that ultimately I shall offend any, by proving — or at least stating as capable of positive proof — the connection of all that is best in the crafts

1 This was first read at the Royal College of Science in Dublin in 1868 and was in 1871 included by Ruskin as a third lecture in *Sesame and Lilies*, the first two lectures of which had been published in 1865.— Editor.

2 That no reference should be made to religious questions.

and arts of man, with the simplicity of his faith, and the sincerity of his patriotism.

But I speak to you under another disadvantage, by which I am checked in frankness of utterance, not here only, but everywhere: namely, that I am never fully aware how far my audiences are disposed to give me credit for real knowledge of my subject, or how far they grant me attention only because I have been sometimes thought an ingenious or pleasant essayist upon it. For I have had what, in many respects, I boldly call the misfortune, to set my words sometimes prettily together; not without a foolish vanity in the poor knack that I had of doing so: until I was heavily punished for this pride, by finding that many people thought of the words only, and cared nothing for their meaning. Happily, therefore, the power of using such pleasant language — if indeed it ever were mine — is passing away from me; and whatever I am now able to say at all, I find myself forced to say with great plainness. For my thoughts have changed also, as my words have; and whereas in earlier life, what little influence I obtained was due perhaps chiefly to the enthusiasm with which I was able to dwell on the beauty of the physical clouds, and of their colors in the sky; so all the influence I now desire to retain must be due to the earnestness with which I am endeavoring to trace the form and beauty of another kind of cloud than those; the bright cloud of which it is written — "What is your life? It is even as a vapor that appeareth for a little time, and then vanisheth away."

I suppose few people reach the middle or latter period of their age, without having, at some moment of change or disappointment, felt the truth of those bitter words;

and been startled by the fading of the sunshine from the cloud of their life into the sudden agony of the knowledge that the fabric of it was as fragile as a dream, and the endurance of it as transient as the dew. But it is not always that, even at such times of melancholy surprise, we can enter into any true perception that this human life shares in the nature of it, not only the evanescence, but the mystery of the cloud; that its avenues are wreathed in darkness, and its forms and courses no less fantastic, than spectral and obscure; so that not only in the vanity which we cannot grasp, but in the shadow which we cannot pierce, it is true of this cloudy life of ours, that "man walketh in a vain shadow, and disquieteth himself in vain."

And least of all, whatever may have been the eagerness of our passions, or the height of our pride, are we able to understand in its depths the third and most solemn character in which our life is like those clouds of heaven; that to it belongs not only their transience, not only their mystery, but also their power; that in the cloud of the human soul there is a fire stronger than the lightning, and a grace more precious than the rain; and that though of the good and evil it shall one day be said alike, that the place that knew them knows them no more, there is an infinite separation between those whose brief presence had there been a blessing, like the mist of Eden that went up from the earth to water the garden, and those whose place knew them only as a drifting and changeful shade, of whom the Heavenly sentence is, that they are "wells without water; clouds that are carried with a tempest, to whom the mist of darkness is reserved forever."

To those among us, however, who have lived long

enough to form some just estimate of the rate of the changes which are, hour by hour in accelerating catastrophe, manifesting themselves in the laws, the arts, and the creeds of men, it seems to me, that now at least, if never at any former time, the thoughts of the true nature of our life, and of its powers and responsibilities, should present themselves with absolute sadness and sternness. And although I know that this feeling is much deepened in my own mind by disappointment, which, by chance, has attended the greater number of my cherished purposes, I do not for that reason distrust the feeling itself, though I am on my guard against an exaggerated degree of it: nay, I rather believe that in periods of new effort and violent change, disappointment is a wholesome medicine; and that in the secret of it, as in the twilight so beloved by Titian, we may see the colors of things with deeper truth than in the most dazzling sunshine. . . . You know there is a tendency in the minds of many men, when they are heavily disappointed in the main purposes of their life, to feel, and perhaps in warning, perhaps in mockery, to declare, that life itself is a vanity. Because it has disappointed them, they think its nature is of disappointment always, or at best, of pleasure that can be grasped by imagination only; that the cloud of it has no strength nor fire within; but is a painted cloud only, to be delighted in, yet despised. You know how beautifully Pope has expressed this particular phase of thought: —

> "Meanwhile opinion gilds, with varying rays,
> These painted clouds that beautify our days;
> Each want of happiness by hope supplied,
> And each vacuity of sense, by pride.
> Hope builds as fast as Knowledge can destroy;

> In Folly's cup, still laughs the bubble joy.
> One pleasure past, another still we gain,
> And not a vanity is given in vain."

But the effect of failure upon my own mind has been just the reverse of this. The more that my life disappointed me, the more solemn and wonderful it became to me. It seemed, contrarily to Pope's saying, that the vanity of it *was* indeed given in vain; but that there was something behind the veil of it, which was not vanity. It became to me not a painted cloud, but a terrible and impenetrable one: not a mirage, which vanished as I drew near, but a pillar of darkness, to which I was forbidden to draw near. For I saw that both my own failure, and such success in petty things as in its poor triumph seemed to me worse than failure, came from the want of sufficiently earnest effort to understand the whole law and meaning of existence, and to bring it to noble and due end; as, on the other hand, I saw more and more clearly that all enduring success in the arts, or in any other occupation, had come from the ruling of lower purposes, not by a conviction of their nothingness, but by a solemn faith in the advancing power of human nature, or in the promise, however dimly apprehended, that the mortal part of it would one day be swallowed up in immortality; and that, indeed, the arts themselves never had reached any vital strength or honor, but in the effort to proclaim this immortality, and in the service either of great and just religion, or of some unselfish patriotism, and law of such national life as must be the foundation of religion.

Nothing that I have ever said is more true or necessary — nothing has been more misunderstood or mis-

applied — than my strong assertion that the arts can never be right themselves unless their motive is right. It is misunderstood this way: weak painters, who have never learned their business, and cannot lay a true line, continually come to me, crying out — "Look at this picture of mine; it *must* be good, I had such a lovely motive. I have put my whole heart into it, and taken years to think over its treatment." Well, the only answer for these people is — if one had the cruelty to make it — "Sir, you cannot think over *any*thing in any number of years,— you haven't the head to do it; and though you had fine motives, strong enough to make you burn yourself in a slow fire, if only first you could paint a picture, you can't paint one, nor half an inch of one; you haven't the hand to do it."

But, far more decisively we have to say to the men who *do* know their business, or may know it if they choose — "Sir, you have this gift, and a mighty one; see that you serve your nation faithfully with it. It is a greater trust than ships and armies: you might cast *them* away, if you were their captain, with less treason to your people than in casting your own glorious power away, and serving the devil with it instead of men. Ships and armies you may replace if they are lost, but a great intellect, once abused, is a curse to the earth forever."

This, then, I meant by saying that the arts must have noble motive. This also I said respecting them, that they never had prospered, nor could prosper, but when they had such true purpose, and were devoted to the proclamation of divine truth or law. And yet I saw also that they had always failed in this proclamation — that poetry, and sculpture, and painting,

though only great when they strove to teach us something about the gods, never had taught us anything trustworthy about the gods, but had always betrayed their trust in the crisis of it, and, with their powers at the full reach, became ministers to pride and to lust. And I felt also, with increasing amazement, the unconquerable apathy in ourselves the hearers, no less than in these the teachers; and that while the wisdom and rightness of every act and art of life could only be consistent with a right understanding of the ends of life, we were all plunged as in a languid dream — our hearts fat, and our eyes heavy, and our ears closed, lest the inspiration of hand or voice should reach us — lest we should see with our eyes, and understand with our hearts, and be healed.

This intense apathy in all of us is the first great mystery of life; it stands in the way of every perception, every virtue. There is no making ourselves feel enough astonishment at it. That the occupations or pastimes of life should have no motive, is understandable; but — That life itself should have no motive — that we neither care to find out what it may lead to, nor to guard against its being forever taken away from us — here is a mystery indeed. For just suppose I were able to call at this moment to any one in this audience by name, and to tell him positively that I knew a large estate had been lately left to him on some curious conditions; but that though I knew it was large, I did not know how large, nor even where it was — whether in the East Indies or the West, or in England, or at the Antipodes. I only knew it was a vast estate, and that there was a chance of his losing it altogether if he did not soon find out on what terms

it had been left to him. Suppose I were able to say this positively to any single man in this audience, and he knew that I did not speak without warrant, do you think that he would rest content with that vague knowledge, if it were anywise possible to obtain more? Would he not give every energy to find some trace of the facts, and never rest till he had ascertained where this place was, and what it was like? And suppose he were a young man, and all he could discover by his best endeavor was that the estate was never to be his at all, unless he persevered, during certain years of probation, in an orderly and industrious life; but that, according to the rightness of his conduct, the portion of the estate assigned to him would be greater or less, so that it literally depended on his behavior from day to day whether he got ten thousand a year, or thirty thousand a year, or nothing whatever — would you not think it strange if the youth never troubled himself to satisfy the conditions in any way, nor even to know what was required of him, but lived exactly as he chose, and never inquired whether his chances of the estate were increasing or passing away? Well, you know that this is actually and literally so with the greater number of the educated persons now living in Christian countries. Nearly every man and woman in any company such as this, outwardly professes to believe — and a large number unquestionably think they believe — much more than this; not only that a quite unlimited estate is in prospect for them if they please the Holder of it, but that the infinite contrary of such a possession — an estate of perpetual misery — is in store for them if they displease this great Land-Holder, this great Heaven-Holder. And yet there is not one

in a thousand of these human souls that cares to think, for ten minutes of the day, where this estate is or how beautiful it is, or what kind of life they are to lead in it, or what kind of life they must lead to obtain it.

You fancy that you care to know this: so little do you care that, probably, at this moment many of you are displeased with me for talking of the matter! You came to hear about the Art of this world, not about the Life of the next, and you are provoked with me for talking of what you can hear any Sunday in church. But do not be afraid. I will tell you something before you go about pictures, and carvings, and pottery, and what else you would like better to hear of than the other world. Nay, perhaps you say, "We want you to talk of pictures and pottery, because we are sure that you know something of them, and you know nothing of the other world." Well — I don't. That is quite true. But the very strangeness and mystery of which I urge you to take notice, is in this — that I do not; — nor you either. Can you answer a single bold question unflinchingly about that other world? — Are you sure there is a heaven? Sure there is a hell? Sure that men are dropping before your faces through the pavements of these streets into eternal fire, or sure that they are not? Sure that at your own death you are going to be delivered from all sorrow, to be endowed with all virtue, to be gifted with all felicity, and raised into perpetual companionship with a King, compared to whom the kings of the earth are as grasshoppers, and the nations as the dust of His feet? Are you sure of this? or, if not sure, do any of us so much as care to make it sure? and, if not, how can anything that we do be right — how can anything we think be wise?

what honor can there be in the arts that amuse us, or what profit in the possessions that please?

Is not this a mystery of life?

But farther, you may, perhaps, think it a beneficent ordinance for the generality of men that they do not, with earnestness or anxiety, dwell on such questions of the future because the business of the day could not be done if this kind of thought were taken by all of us for the morrow. Be it so: but at least we might anticipate that the greatest and wisest of us, who were evidently the appointed teachers of the rest, would set themselves apart to seek out whatever could be surely known of the future destinies of their race; and to teach this in no rhetorical or ambiguous manner, but in the plainest and most severely earnest words.

Now, the highest representatives of men who have thus endeavored, during the Christian era, to search out these deep things, and relate them, are Dante and Milton. There are none who for earnestness of thought, for mastery of word, can be classed with these. I am not at present, mind you, speaking of persons set apart in any priestly or pastoral office, to deliver creeds to us, or doctrines; but of men who try to discover and set forth, as far as by human intellect is possible, the facts of the other world. Divines may perhaps teach us how to arrive there, but only these two poets have in any powerful manner striven to discover, or in any definite words professed to tell, what we shall see and become there; or how those upper and nether worlds are, and have been, inhabited.

And what have they told us? Milton's account of the most important event in his whole system of the universe, the fall of the angels, is evidently unbeliev-

able to himself; and the more so, that it is wholly founded on, and in a great part spoiled and degraded from, Hesiod's account of the decisive war of the younger gods with the Titans. The rest of his poem is a picturesque drama, in which every artifice of invention is visibly and consciously employed; not a single fact being, for an instant, conceived as tenable by any living faith. Dante's conception is far more intense, and, by himself, for the time, not to be escaped from; it is indeed a vision, but a vision only, and that one of the wildest that ever entranced a soul — a dream in which every grotesque type or fantasy of heathen tradition is renewed, and adorned; and the destinies of the Christian Church, under their most sacred symbols, become literally subordinate to the praise, and are only to be understood by the aid, of one dear Florentine maiden.

I tell you truly that, as I strive more with this strange lethargy and trance in myself, and awake to the meaning and power of life, it seems daily more amazing to me that men such as these should dare to play with the most precious truths (or the most deadly untruths) by which the whole human race listening to them could be informed, or deceived; — all the world their audiences forever, with pleased ear, and passionate heart; — and yet, to this submissive infinitude of souls, and evermore succeeding and succeeding multitude, hungry for bread of life, they do but play upon sweetly modulated pipes; with pompous nomenclature adorn the councils of hell; touch a troubadour's guitar to the courses of the suns; and fill the openings of eternity, before which prophets have veiled their faces, and which angels desire to look into, with idle puppets of

their scholastic imagination, and melancholy lights of frantic faith in their lost mortal love.

Is not this a mystery of life?

But more. We have to remember that these two great teachers were both of them warped in their temper, and thwarted in their search for truth. They were men of intellectual war, unable, through darkness of controversy, or stress of personal grief, to discern where their own ambition modified their utterances of the moral law; or their own agony mingled with their anger at its violation. But greater men than these have been — innocent-hearted — too great for contest. Men, like Homer and Shakespeare, of so unrecognized personality, that it disappears in future ages, and becomes ghostly, like the tradition of a lost heathen god. Men, therefore, to whose unoffended, uncondemning sight, the whole of human nature reveals itself in a pathetic weakness, with which they will not strive; or in mournful and transitory strength, which they dare not praise. And all Pagan and Christian Civilization thus becomes subject to them. It does not matter how little, or how much, any of us have read, either of Homer or Shakespeare; everything round us, in substance or in thought, has been moulded by them. All Greek gentlemen were educated under Homer. All Roman gentlemen, by Greek literature. All Italian, and French, and English gentlemen, by Roman literature, and by its principles. Of the scope of Shakespeare, I will say only, that the intellectual measure of every man since born, in the domains of creative thought, may be assigned to him, according to the degree in which he has been taught by Shakespeare. Well, what do these two men, centres of mortal intelli-

gence, deliver to us of conviction respecting what it most behooves that intelligence to grasp? What is their hope — their crown of rejoicing? what manner of exhortation have they for us, or of rebuke? what lies next their own hearts, and dictates their undying words? Have they any peace to promise to our unrest — any redemption to our misery?

Take Homer first, and think if there is any sadder image of human fate than the great Homeric story. The main features in the character of Achilles are its intense desire of justice, and its tenderness of affection. And in that bitter song of the Iliad, this man, though aided continually by the wisest of the gods, and burning with the desire of justice in his heart, becomes yet, through ill-governed passion, the most unjust of men: and, full of the deepest tenderness in his heart, becomes yet, through ill-governed passion, the most cruel of men. Intense alike in love and in friendship, he loses, first his mistress, and then his friend; for the sake of the one, he surrenders to death the armies of his own land; for the sake of the other, he surrenders all. Will a man lay down his life for his friend? Yea — even for his *dead* friend, this Achilles, though goddess-born and goddess-taught, gives up his kingdom, his country, and his life — casts alike the innocent and guilty, with himself, into one gulf of slaughter, and dies at last by the hand of the basest of his adversaries.

Is not this a mystery of life?

But what, then, is the message to us of our own poet, and searcher of hearts, after fifteen hundred years of Christian faith have been numbered over the graves of men? Are his words more cheerful than the Heathen's — is his hope more near — his trust more sure — his

reading of fate more happy? Ah, no! He differs from the Heathen poet chiefly in this — that he recognizes, for deliverance, no gods nigh at hand; and that, by petty chance — by momentary folly — by broken message — by fool's tyranny — or traitor's snare, the strongest and most righteous are brought to their ruin, and perish without word of hope. He indeed, as part of his rendering of character, ascribes the power and modesty of habitual devotion to the gentle and the just. The death-bed of Katharine is bright with visions of angels; and the great soldier-king, standing by his few dead, acknowledges the presence of the Hand that can save alike by many or by few. But observe that from those who with deepest spirit, meditate, and with deepest passion, mourn, there are no such words as these; nor in their hearts are any such consolations. Instead of the perpetual sense of the helpful presence of the Deity, which through all heathen tradition is the source of heroic strength, in battle, in exile, and in the valley of the shadow of death, we find only in the great Christian poet, the consciousness of a moral law, through which "the gods are just, and of our pleasant vices make instruments to scourge us"; and of the resolved arbitration of the destinies, that conclude into precision of doom what we feebly and blindly began; and force us, when our indiscretion serves us, and our deepest plots do pall, to the confession that "there's a divinity that shapes our ends, rough hew them how we will."

Is not this a mystery of life?

Be it so, then. About this human life that is to be, or that is, the wise religious men tell us nothing that we can trust; and the wise contemplative men, nothing

that can give us peace. But there is yet a third class, to whom we may turn — the wise practical men. We have sat at the feet of the poets who sang of heaven, and they have told us their dreams. We have listened to the poets who sang of earth, and they have chanted to us dirges and words of despair. But there is one class of men more:— men, not capable of vision, nor sensitive to sorrow, but firm of purpose — practised in business; learned in all that can be (by handling) known. Men, whose hearts and hopes are wholly in this present world, from whom, therefore, we may surely learn, at least, how, at present, conveniently to live in it. What will *they* say to us, or show us by example? These kings — these councilors — these statesmen and builders of kingdoms — these capitalists and men of business, who weigh the earth, and the dust of it, in a balance. They know the world, surely; and what is the mystery of life to us, is none to them. They can surely show us how to live, while we live, and to gather out of the present world what is best.

I think I can best tell you their answer by telling you a dream I had once. For though I am no poet, I have dreams sometimes:— I dreamed I was at a child's May-day party, in which every means of entertainment had been provided for them by a wise and kind host. It was in a stately house, with beautiful gardens attached to it; and the children had been set free in the rooms and gardens, with no care whatever but how to pass their afternoon rejoicingly. They did not, indeed, know much about what was to happen next day; and some of them, I thought, were a little frightened, because there was a chance of their being sent to a new

school where there were examinations; but they kept the thoughts of that out of their heads as well as they could, and resolved to enjoy themselves. The house, I said, was in a beautiful garden, and in the garden were all kinds of flowers; sweet, grassy banks for rest; and smooth lawns for play; and pleasant streams and woods; and rocky places for climbing. And the children were happy for a little while, but presently they separated themselves into parties; and then each party declared it would have a piece of the garden for its own, and that none of the others should have anything to do with that piece. Next, they quarrelled violently which pieces they would have; and at last the boys took up the thing, as boys should do, "practically," and fought in the flower-beds till there was hardly a flower left standing; then they trampled down each other's bits of the garden out of spite; and the girls cried till they could cry no more; and so they all lay down at last breathless in the ruin, and waited for the time when they were to be taken home in the evening.[1]

Meanwhile, the children in the house had been making themselves happy also in their manner. For them, there had been provided every kind of indoor pleasure: there was music for them to dance to; and the library was open, with all manner of amusing books; and there was a museum full of the most curious shells, and animals, and birds; and there was a workshop, with lathes and carpenter's tools, for the ingenious boys; and there were pretty fantastic dresses, for the girls

1 I have sometimes been asked what this means. I intended it to set forth the wisdom of men in war contending for kingdoms, and what follows to set forth their wisdom in peace, contending for wealth.

to dress in; and there were microscopes, and kaleidoscopes; and whatever toys a child could fancy; and a table, in the dining-room, loaded with everything nice to eat.

But, in the midst of all this, it struck two or three of the more "practical" children, that they would like some of the brass-headed nails that studded the chairs; and so they set to work to pull them out. Presently, the others, who were reading, or looking at shells, took a fancy to do the like; and, in a little while, all the children, nearly, were spraining their fingers, in pulling out brass-headed nails. With all that they could pull out, they were not satisfied; and then, everybody wanted some of somebody else's. And at last, the really practical and sensible ones declared, that nothing was of any real consequence, that afternoon, except to get plenty of brass-headed nails; and that the books, and the cakes, and the microscopes were of no use at all in themselves, but only, if they could be exchanged for nail-heads. And at last they began to fight for nail-heads, as the others fought for the bits of garden. Only here and there, a despised one shrank away into a corner, and tried to get a little quiet with a book, in the midst of the noise; but all the practical ones thought of nothing else but counting nail-heads all the afternoon — even though they knew they would not be allowed to carry so much as one brass knob away with them. But no — it was — "Who has most nails? I have a hundred, and you have fifty;" or, "I have a thousand, and you have two. I must have as many as you before I leave the house, or I cannot possibly go home in peace." At last, they made so much noise that I awoke, and thought to myself, "What a false

dream that is, of *children!*" The child is the father of the man; and wiser. Children never do such foolish things. Only men do.

But there is yet one last class of persons to be interrogated. The wise religious men we have asked in vain; the wise contemplative men, in vain; the wise worldly men, in vain. But there is another group yet. In the midst of this vanity of empty religion — of tragic contemplation — of wrathful and wretched ambition, and dispute for dust, there is yet one great group of persons, by whom all these disputers live — the persons who have determined, or have had it by a beneficent Providence determined for them, that they will do something useful; that whatever may be prepared for them hereafter, or happen to them here, they will, at least, deserve the food that God gives them by winning it honorably: and that, however fallen from the purity, or far from the peace, of Eden, they will carry out the duty of human dominion, though they have lost its felicity; and dress and keep the wilderness, though they no more can dress or keep the garden.

These,— hewers of wood and drawers of water,— these, bent under burdens, or torn of scourges — these, that dig and weave — that plant and build; workers in wood, and in marble, and in iron — by whom all food, clothing, habitation, furniture, and means of delight are produced, for themselves, and for all men beside; men, whose deeds are good, though their words may be few; men, whose lives are serviceable, be they never so short, and worthy of honor, be they never so humble; — from these surely, at least, we may receive some clear message of teaching; and pierce, for an instant, into the mystery of life, and of its arts.

Yes; from these, at last, we do receive a lesson. But I grieve to say, or rather — for that is the deeper truth of the matter — I rejoice to say — this message of theirs can only be received by joining them — not by thinking about them.

You sent for me to talk to you of art; and I have obeyed you in coming. But the main thing I have to tell you is,— that art must not be talked about. The fact that there is talk about it at all, signifies that it is ill done, or cannot be done. No true painter ever speaks, or ever has spoken, much of his art. The greatest speak nothing. Even Reynolds is no exception, for he wrote of all that he could not himself do, and was utterly silent respecting all that he himself did.

The moment a man can really do his work he becomes speechless about it. All words become idle to him — all theories. Does a bird need to theorize about building its nest, or boast of it when built? All good work is essentially done that way — without hesitation, without difficulty, without boasting; and in the doers of the best, there is an inner and involuntary power which approximates literally to the instinct of an animal — nay, I am certain that in the most perfect human artists, reason does *not* supersede instinct, but is added to an instinct as much more divine than that of the lower animals as the human body is more beautiful than theirs; that a great singer sings not with less instinct than the nightingale, but with more — only more various, applicable, and governable; that a great architect does not build with less instinct than the beaver or the bee, but with more — with an innate cunning of proportion that embraces all beauty, and a

divine ingenuity of skill that improvises all construction.

. . . . . .

And now, returning to the broader question, what these arts and labors of life have to teach us of its mystery, this is the first of their lessons — that the more beautiful the art, the more it is essentially the work of people who *feel themselves wrong;* — who are striving for the fulfillment of a law, and the grasp of a loveliness, which they have not yet attained, which they feel even farther and farther from attaining the more they strive for it. And yet, in still deeper sense, it is the work of people who know also that they are right. The very sense of inevitable error from their purpose marks the perfectness of that purpose, and the continued sense of failure arises from the continued opening of the eyes more clearly to all the sacredest laws of truth.

This is one lesson. The second is a very plain, and greatly precious one: namely — that whenever the arts and labors of life are fulfilled in this spirit of striving against misrule, and doing whatever we have to do, honorably and perfectly, they invariably bring happiness, as much as seems possible to the nature of man. In all other paths by which that happiness is pursued there is disappointment, or destruction: for ambition and for passion there is no rest — no fruition; the fairest pleasures of youth perish in a darkness greater than their past light: and the loftiest and purest love too often does but inflame the cloud of life with endless fire of pain. But, ascending from lowest to highest, through every scale of human industry, that industry worthily followed, gives peace. Ask the laborer in the

field, at the forge, or in the mine; ask the patient, delicate-fingered artisan, or the strong-armed, fiery-hearted worker in bronze, and in marble, and with the colors of light; and none of these, who are true workmen, will ever tell you, that they have found the law of heaven an unkind one — that in the sweat of their face they should eat bread, till they return to the ground; nor that they ever found it an unrewarded obedience, if, indeed, it was rendered faithfully to the command — "Whatsoever thy hand findeth to do — do it with thy might."

These are the two great and constant lessons which our laborers teach us of the mystery of life. But there is another, and a sadder one, which they cannot teach us, which we must read on their tombstones.

"Do it with thy might." There have been myriads upon myriads of human creatures who have obeyed this law — who have put every breath and nerve of their being into its toil — who have devoted every hour, and exhausted every faculty — who have bequeathed their unaccomplished thoughts at death — who, being dead, have yet spoken, by majesty of memory, and strength of example. And, at last, what has all this "Might" of humanity accomplished, in six thousand years of labor and sorrow? What has it *done?* Take the three chief occupations and arts of men, one by one, and count their achievements. Begin with the first — the lord of them all — Agriculture. Six thousand years have passed since we were set to till the ground, from which we were taken. How much of it is tilled? How much of that which is, wisely or well? In the very centre and chief garden of Europe — where the two forms of parent Christianity have had their for-

tresses — where the noble Catholics of the Forest Cantons, and the noble Protestants of the Vaudois valleys, have maintained, for dateless ages, their faiths and liberties — there the unchecked Alpine rivers yet run wild in devastation; and the marshes, which a few hundred men could redeem with a year's labor, still blast their helpless inhabitants into fevered idiotism. That is so, in the centre of Europe! While, on the near coast of Africa, once the Garden of the Hesperides, an Arab woman, but a few sunsets since, ate her child, for famine. And, with all the treasures of the East at our feet, we, in our own dominion, could not find a few grains of rice, for a people that asked of us no more; but stood by, and saw five hundred thousand of them perish of hunger.

Then after agriculture, the art of kings, take the next head of human arts — Weaving; the art of queens, honored of all noble Heathen women, in the person of their virgin goddess — honored of all Hebrew women, by the word of their wisest king — "She layeth her hands to the spindle, and her hands hold the distaff; she stretcheth out her hand to the poor. She is not afraid of the snow for her household, for all her household are clothed with scarlet. She maketh herself covering of tapestry; her clothing is silk and purple. She maketh fine linen, and selleth it, and delivereth girdles to the merchant." What have we done in all these thousands of years with this bright art of Greek maid and Christian matron? Six thousand years of weaving, and have we learned to weave? Might not every naked wall have been purple with tapestry, and every feeble breast fenced with sweet colors from the cold? What have we done? Our

fingers are too few, it seems, to twist together some poor covering for our bodies. We set our streams to work for us, and choke the air with fire, to turn our spinning-wheels — and,— *are we yet clothed?* Are not the streets of the capitals of Europe foul with sale of cast clouts and rotten rags? Is not the beauty of your sweet children left in wretchedness of disgrace, while, with better honor, nature clothes the brood of the bird in its nest, and the suckling of the wolf in her den? And does not every winter's snow robe what you have not robed, and shroud what you have not shrouded; and every winter's wind bear up to heaven its wasted souls, to witness against you hereafter, by the voice of their Christ,— "I was naked, and ye clothed me not"?

Lastly — take the Art of Building — the strongest — proudest — most orderly — most enduring of the arts of man; that of which the produce is in the surest manner accumulative, and need not perish, or be replaced; but if once well done, will stand more strongly than the unbalanced rocks — more prevalently than the crumbling hills. The art which is associated with all civic pride and sacred principle; with which men record their power — satisfy their enthusiasm — make sure their defence — define and make dear their habitation. And in six thousand years of building, what have we done? Of the greater part of all that skill and strength, *no* vestige is left, but fallen stones, that encumber the fields and impede the streams. But, from this waste of disorder, and of time, and of rage, what *is* left to us? Constructive and progressive creatures that we are, with ruling brains, and forming hands, capable of fellowship, and thirsting for fame, can we

not contend, in comfort, with the insects of the forest, or, in achievement, with the worm of the sea? The white surf rages in vain against the ramparts built by poor atoms of scarcely nascent life; but only ridges of formless ruin mark the places where once dwelt our noblest multitudes. The ant and the moth have cells for each of their young, but our little ones lie in festering heaps, in homes that consume them like graves; and night by night, from the corners of our streets, rises up the cry of the homeless — "I was a stranger, and ye took me not in."

Must it be always thus? Is our life forever to be without profit — without possession? Shall the strength of its generations be as barren as death; or cast away their labor, as the wild fig-tree casts her untimely figs? Is it all a dream then — the desire of the eyes and the pride of life — or, if it be, might we not live in nobler dream than this? The poets and prophets, the wise men, and the scribes, though they have told us nothing about a life to come, have told us much about the life that is now. They have had — they also,— their dreams, and we have laughed at them. They have dreamed of mercy, and of justice; they have dreamed of peace and good-will; they have dreamed of labor undisappointed, and of rest undisturbed; they have dreamed of fulness in harvest, and overflowing in store; they have dreamed of wisdom in council, and of providence in law; of gladness of parents, and strength of children, and glory of grey hairs. And at these visions of theirs we have mocked, and held them for idle and vain, unreal and unaccomplishable. What have we accomplished with our realities? Is this what has come of our worldly wisdom, tried against their

folly? this, our mightiest possible, against their impotent ideal? or, have we only wandered among the spectra of a baser felicity, and chased phantoms of the tombs, instead of visions of the Almighty; and walked after the imaginations of our evil hearts, instead of after the counsels of Eternity, until our lives — not in the likeness of the cloud of heaven, but of the smoke of hell — have become "as a vapor, that appeareth for a little time, and then vanisheth away"?

Does it vanish, then? Are you sure of that? — sure, that the nothingness of the grave will be a rest from this troubled nothingness; and that the coiling shadow, which disquiets itself in vain, cannot change into the smoke of the torment that ascends forever? Will any answer that they *are* sure of it, and that there is no fear, nor hope, nor desire, nor labor, whither they go? Be it so: will you not, then, make as sure of the Life that now is, as you are of the Death that is to come? Your hearts are wholly in this world — will you not give them to it wisely, as well as perfectly? And see, first of all, that you *have* hearts, and sound hearts, too, to give. Because you have no heaven to look for, is that any reason that you should remain ignorant of this wonderful and infinite earth, which is firmly and instantly given you in possession? Although your days are numbered, and the following darkness sure, is it necessary that you should share the degradation of the brute, because you are condemned to its mortality; or live the life of the moth, and of the worm, because you are to companion them in the dust? Not so; we may have but a few thousands of days to spend, perhaps hundreds only — perhaps tens; nay, the longest of our time and best, looked back on, will be but as a moment,

as the twinkling of an eye; still we are men, not insects; we are living spirits, not passing clouds. "He maketh the winds His messengers; the momentary fire, His minister;" and shall we do less than *these?* Let us do the work of men while we bear the form of them; and, as we snatch our narrow portion of time out of Eternity, snatch also our narrow inheritance of passion out of Immortality — even though our lives *be* as a vapor, that appeareth for a little time, and then vanisheth away.

But there are some of you who believe not this — who think this cloud of life has no such close — that it is to float, revealed and illumined, upon the floor of heaven, in the day when He cometh with clouds, and every eye shall see Him. Some day, you believe, within these five, or ten, or twenty years, for every one of us the judgment will be set, and the books opened. If that be true, far more than that must be true. Is there but one day of judgment? Why, for us every day is a day of judgment — every day is a Dies Iræ, and writes its irrevocable verdict in the flame of its west. Think you that judgment waits till the doors of the grave are opened? It waits at the doors of your houses — it waits at the corners of your streets; we are in the midst of judgment — the insects that we crush are our judges — the moments we fret away are our judges — the elements that feed us, judge, as they minister — and the pleasures that deceive us, judge, as they indulge. Let us, for our lives, do the work of Men while we bear the form of them, if indeed those lives are *Not* as a vapor, and do *Not* vanish away.

"The work of men" — and what is that? Well,

we may any of us know very quickly, on the condition of being wholly ready to do it. But many of us are for the most part thinking, not of what we are to do, but of what we are to get; and the best of us are sunk into the sin of Ananias, and it is a mortal one — we want to keep back part of the price; and we continually talk of taking up our cross, as if the only harm in a cross was the *weight* of it — as if it was only a thing to be carried, instead of to be — crucified upon. "They that are His have crucified the flesh, with the affections and lusts." Does that mean, think you, that in time of national distress, of religious trial, of crisis for every interest and hope of humanity — none of us will cease jesting, none cease idling, none put themselves to any wholesome work, none take so much as a tag of lace off their footman's coats, to save the world? Or does it rather mean, that they are ready to leave houses, lands, and kindreds — yes, and life, if need be? Life! — some of us are ready enough to throw that away, joyless as we have made it. But "*station* in Life," — how many of us are ready to quit *that?* Is it not always the great objection, where there is question of finding something useful to do — "We cannot leave our stations in Life"?

Those of us who really cannot — that is to say, who can only maintain themselves by continuing in some business or salaried office, have already something to do; and all that they have to see to is, that they do it honestly and with all their might. But with most people who use that apology, "remaining in the station of life to which Providence has called them" means keeping all the carriages, and all the footmen and large houses they can possibly pay for; and, once for all, I

say that if ever Providence *did* put them into stations of that sort — which is not at all a matter of certainty — Providence is just now very distinctly calling them out again. Levi's station in life was the receipt of custom; and Peter's, the shore of Galilee; and Paul's, the antechambers of the High Priest,— which "station in life" each had to leave, with brief notice.

And whatever our station in life may be, at this crisis, those of us who mean to fulfil our duty ought first, to live on as little as we can; and, secondly, to do all the wholesome work for it we can, and to spend all we can spare in doing all the sure good we can.

And sure good is, first in feeding people, then in dressing people, then in lodging people, and lastly in rightly pleasing people, with arts, or sciences, or any other subject of thought.

I say first in feeding; and, once for all, do not let yourselves be deceived by any of the common talk of "indiscriminate charity." The order to us is not to feed the deserving hungry, nor the industrious hungry, nor the amiable and well-intentioned hungry, but simply to feed the hungry. It is quite true, infallibly true, that if any man will not work, neither should he eat — think of that, and every time you sit down to your dinner, ladies and gentlemen, say solemnly, before you ask a blessing, "How much work have I done to-day for my dinner?" But the proper way to enforce that order on those below you, as well as on yourselves, is not to leave vagabonds and honest people to starve together, but very distinctly to discern and seize your vagabond; and shut your vagabond up out of honest people's way, and very sternly then see that, until he has worked, he does *not* eat. But the first thing is to

be sure you have the food to give; and, therefore, to enforce the organization of vast activities in agriculture and in commerce, for the production of the wholesomest food, and proper storing and distribution of it, so that no famine shall any more be possible among civilized beings. There is plenty of work in this business alone, and at once, for any number of people who like to engage in it.

Secondly, dressing people — that is to say, urging every one within reach of your influence to be always neat and clean, and giving them means of being so. In so far as they absolutely refuse, you must give up the effort with respect to them, only taking care that no children within your sphere of influence shall any more be brought up with such habits; and that every person who is willing to dress with propriety shall have encouragement to do so. And the first absolutely necessary step towards this is the gradual adoption of a consistent dress for different ranks of persons, so that their rank shall be known by their dress; and the restriction of the changes of fashion within certain limits. All which appears for the present quite impossible; but it is only so far even difficult as it is difficult to conquer our vanity, frivolity, and desire to appear what we are not. And it is not, nor ever shall be, creed of mine, that these mean and shallow vices are unconquerable by Christian women.

And then, thirdly, lodging people, which you may think should have been put first, but I put it third, because we must feed and clothe people where we find them, and lodge them afterwards. And providing lodgment for them means a great deal of vigorous legislature, and cutting down of vested interests that

stand in the way, and after that, or before that, so far as we can get it, thorough sanitary and remedial action in the houses that we have; and then the building of more, strongly, beautifully, and in groups of limited extent, kept in proportion to their streams, and walled round, so that there may be no festering and wretched suburb anywhere, but clean and busy street within, and the open country without, with a belt of beautiful garden and orchard round the walls, so that from any part of the city perfectly fresh air and grass, and sight of far horizon, might be reachable in a few minutes' walk. This the final aim; but in immediate action every minor and possible good to be instantly done, when, and as, we can; roofs mended that have holes in them — fences patched that have gaps in them — walls buttressed that totter — and floors propped that shake; cleanliness and order enforced with our own hands and eyes, till we are breathless, every day. And all the fine arts will healthily follow. I myself have washed a flight of stone stairs all down, with bucket and broom, in a Savoy inn, where they hadn't washed their stairs since they first went up them; and I never made a better sketch than that afternoon.

These, then, are the three first needs of civilized life; and the law for every Christian man and woman is, that they shall be in direct service towards one of these three needs, as far as is consistent with their own special occupation, and if they have no special business, then wholly in one of these services. And out of such exertion in plain duty all other good will come; for in this direct contention with material evil, you will find out the real nature of all evil; you will discern by the various kinds of resistance, what is really the fault and

main antagonism to good; also you will find the most unexpected helps and profound lessons given, and truths will come thus down to us which the speculation of all our lives would never have raised us up to. You will find nearly every educational problem solved, as soon as you truly want to do something; everybody will become of use in their own fittest way, and will learn what is best for them to know in that use. Competitive examination will then, and not till then, be wholesome, because it will be daily, and calm, and in practice; and on these familiar arts, and minute, but certain and serviceable knowledges, will be surely edified and sustained the greater arts and splendid theoretical sciences.

But much more than this. On such holy and simple practice will be founded, indeed, at last, an infallible religion. The greatest of all the mysteries of life, and the most terrible, is the corruption of even the sincerest religion, which is not daily founded on rational, effective, humble, and helpful action. Helpful action, observe! for there is just one law, which, obeyed, keeps all religions pure — forgotten, makes them all false. Whenever in any religious faith, dark or bright, we allow our minds to dwell upon the points in which we differ from other people, we are wrong, and in the devil's power. That is the essence of the Pharisee's thanksgiving — "Lord, I thank Thee that I am not as other men are." At every moment of our lives we should be trying to find out, not in what we differ from other people, but in what we agree with them; and the moment we find we can agree as to anything that should be done, kind or good, (and who but fools couldn't?) then do it; push at it together: you

can't quarrel in a side-by-side push; but the moment that even the best men stop pushing, and begin talking, they mistake their pugnacity for piety, and it's all over. I will not speak of the crimes which in past times have been committed in the name of Christ, nor of the follies which are at this hour held to be consistent with obedience to Him; but I *will* speak of the morbid corruption and waste of vital power in religious sentiment, by which the pure strength of that which should be the guiding soul of every nation, the splendor of its youthful manhood, and spotless light of its maidenhood, is averted or cast away. You may see continually girls who have never been taught to do a single useful thing thoroughly; who cannot sew, who cannot cook, who cannot cast an account, nor prepare a medicine, whose whole life has been passed either in play or in pride; you will find girls like these, when they are earnest-hearted, cast all their innate passion of religious spirit, which was meant by God to support them through the irksomeness of daily toil, into grievous and vain meditation over the meaning of the great Book, of which no syllable was ever yet to be understood but through a deed; all the instinctive wisdom and mercy of their womanhood made vain, and the glory of their pure consciences warped into fruitless agony concerning questions which the laws of common serviceable life would have either solved for them in an instant, or kept out of their way. Give such a girl any true work that will make her active in the dawn, and weary at night, with the consciousness that her fellow-creatures have indeed been the better for her day, and the powerless sorrow of her enthusiasm will transform itself into a majesty of radiant and beneficent peace.

So with our youths. We once taught them to make Latin verses, and called them educated; now we teach them to leap and to row, to hit a ball with a bat, and call them educated. Can they plough, can they sow, can they plant at the right time, or build with a steady hand? Is it the effort of their lives to be chaste, knightly, faithful, holy in thought, lovely in word and deed? Indeed it is, with some, nay, with many, and the strength of England is in them, and the hope; but we have to turn their courage from the toil of war to the toil of mercy; and their intellect from dispute of words to discernment of things; and their knighthood from the errantry of adventure to the state and fidelity of a kingly power. And then, indeed, shall abide, for them and for us, an incorruptible felicity, and an infallible religion; shall abide for us Faith, no more to be assailed by temptation, no more to be defended by wrath and by fear; — shall abide with us Hope, no more to be quenched by the years that overwhelm, or made ashamed by the shadows that betray: — shall abide for us, and with us, the greatest of these; the abiding will, the abiding name of our Father. For the greatest of these is Charity.

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